

Alberta GED and Essential Skills

Facilitator's Guide

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Additional required materials

Pre-assessment Template (Alberta GED and Essential Skills Pre-assessment.xlsx)

PowerPoint (Alberta GED and Essential Skills Writing.pptx)

Introduction

Welcome to the Alberta GED and Essential Skills Facilitator's Guide.

This guide provides information to you, the facilitator, for key program items:

- Overall aim of the program
- Target learner characteristics
- Desired learning outcomes
- Program content
- Delivery method
- Resources required
- Evaluation and measurement

The overall aim of this program is to provide GED and Essential Skills training and preparation for vulnerable and English Language Learning populations.

The reasons to work toward completing the GED are unique to each learner. However, the reasons tend to fall into three main categories: employment needs/requirements; pursuing further education usually in college or trades programs; or self-development.

Each adult learner has their own learning preferences and coping strategies. They also have competing priorities (usually family or work), which often can become barriers to completing studies. Some adult learners may have learning difficulties or disabilities which may or may not have been previously identified. In addition, English Language Learners attempting the GED course work often do not have the English language skills required for success in reading and writing tasks; nor do they have sufficient numeracy to handle the more advanced topics (statistics and algebra) in math and science. With these challenges in mind, extra learning support outside of class is often required. As the facilitator, you will need a flexible approach; you will need to adapt to the needs of the learners; and you may need to refer learners for extra assistance or counsel.

Specific things required for you to facilitate the activities in this guide:

1. *The Steck-Vaughn Complete Canadian GED Preparation Manual* is a central resource that you and each learner should have
2. Each learner requires pens, paper, binders, and a Casio Fx 260 scientific calculator; these resources are used throughout the program
3. Pre-assessment Template is required to enter learner marks for Modules 1, 2, 3 and 4 (Alberta GED and Essential Skills Pre-assessment.xlsx)
4. PowerPoint for Module 2 (Alberta GED and Essential Skills Writing.pptx)
5. Additional resources are identified within the modules

Target learner characteristics

This GED program is intended to serve Low German Mennonite (LGM) and other low literacy adults who are 18 years of age or older.

These learners work primarily as agriculture or factory labourers. Historically, Grade 12 or high school completion was not required for work in these occupations. However, employers are now requesting high school completion as a condition of employment. Many LGMs are seeking assistance in preparation for the GED exams.

The LGM learners were generally only permitted to attend school in Mexico until they were 12 years old. Schooling consisted mainly of instruction from the Bible. They speak Low German, which does not have a text-based component, resulting in weak reading comprehension and general literacy skills when compared to most other English Language Learning populations. Generally speaking, they require extra assistance and support with the Essential Skills of Reading, Writing, Thinking and Numeracy.

The LGM population is a very close-knit community. Their culture is deeply religious and pacifist in nature. Sky science is an area that is frowned upon as looking at the heavens may be an affront to God. Further, their deeply religious background also has an impact on discussions regarding the theory of evolution and history/geological timelines. As the facilitator, you may need to pay particular attention to these sensitive details as theological issues and discussions may arise when addressing concepts regarding wars and revolutions, sky science, theory of evolution, geological history and earth science, and civic/voter participation.

How to use this guide

The driving force behind this manual is not scope and sequence, but rather learner needs centered on the GED learner outcomes/indicators. A “one-size fits all” approach to GED instruction may cover content areas, but loses sight of the needs of the learners. As a result, this manual has not been developed in typical “teacher guide – complete unit” fashion. The scope and sequence of instruction within each module and class will be dependent upon a few variables. These variables will include access to necessary and supplementary resources, facilitator preferences, and most importantly learner needs. The rationale behind this approach is that each class will be unique and have its own strengths and weaknesses. If learners are strong in one particular area, it may not be the best use of time to devote the same amount of time on the topic, when additional time can be allotted to more intensive instruction in weaker areas. If only one learner needs intensive learning in a topic area, then the instruction should be tailored so that individual assistance (inside or outside class time) can be given and the class can move forward in covering the necessary material.

The first activity in Modules 1 through 4 is a pretest. This is a very important step and should not be skipped. This activity allows for the facilitator to develop an understanding of the class’ abilities and skill sets.

By understanding the class' abilities and skill sets, the teacher/facilitator can then answer the following questions:

- Which topics does the class have a generally good grasp?
- Can I move through these topics quite quickly or leave them for individual study?
- Which topics will the class need to have explicit or intensive instruction?
- How much time will I need to devote to intensive instruction and what further resources or supports will need to be provided?

Once the facilitator is able to answer these questions, then he/she can develop a customized scope and sequence of activities to meet the unique needs of the class. The activities need to be developed around the learner outcomes/indicators in each module. Examples of activities have been included in each module.

In Module 1, Activity 2, an approach is described for several math units and lessons. There are print resources for instructors to use. This is not a complete math unit, but rather an approach for intensive instruction in: integers, fractions, exponents and order of operations.

In Module 2, Activity 2, there is a complete unit for writing essays. It can be followed in the order presented; or the facilitator may wish to cover some of the topics in the activity more or less intensively.

For Module 3, the learner outcomes/indicators are relatively easy to group and form individual lessons around. This works best for GED Science instruction as it appears that this is the subject area that has the greatest variability in students' strength/weakness. The site eschooltoday.com is a great internet resource for the Life Science unit, and Physics4Kids.com is a great internet resource for the Physical Sciences unit. Many of the topics are covered in an easy and non-threatening manner, written in relatively plain language, and have colourful and detailed graphics to aid explanations. Activity 2 is a 90-minute lesson prepared to assist facilitators to transition between the Life Sciences and the Physical Sciences units.

In Module 4, Activity 2 is designed to explicitly teach visual literacy. Visual literacy is often one skill set that most instructors assume that learners are able to do on their own. Most students are weak and have not received previous explicit instruction. This important and necessary skill not to be overlooked is the ability to read and interpret graphs and charts. Even though the content on the handouts is more or less focused on geographical, meteorological, and civic service topics, it is a skill most frequently used in GED Social Studies instruction and on the GED test. It is worth the time to devote to this lesson as these skills are also applied to a lesser degree in GED Math and Science.

Module 5's final activity is a GED Test readiness post-test. It is a repeat of the pretest given on the first day of class and should be given on the second last day of instruction. This will allow the teacher/facilitator to mark it and go over it with the class on the last instructional day. If the analysis is completed for each student, it will also allow for a study plan specific to that learner's needs and ability. If a student is still requiring intensive instruction in an area, then individual tutoring can be arranged before the test is written, or the student may wish to delay writing the GED test until such time they are confident with the material after more individualized instruction.

Desired learning outcomes

Good instruction begins with clear intended learning outcomes. We are currently in transition. The current GED test was formatted in 2002. It has been criticized for its content rigor (too easy), and for not being a true high school equivalency measure. As a result, the learning outcomes were revised and additional outcomes were added. A new test has been written. This revised GED was implemented in the US in 2014. This new test is currently being reconstructed for Canadian content, and is expected to be implemented in Alberta in 2017. The outcomes listed in the Social Studies section of this manual are an approximation based on the content covered by the *Steck-Vaughn Complete Canadian GED Preparation Manual*, and the updated United States content outcomes of their US History unit.

The learning outcomes have been updated and more closely approximate high school content equivalencies for the 2014 test being implemented in 2017. This guide lists the GED outcomes that are currently being used, and the outcomes for the 2017 GED test. The nine Canadian Essential Skills outcomes that are listed on the Human Resources and Skills Development website are also listed for comparison and possible transitions between programs. You will notice that there are many outcomes listed. Many instructional activities can address multiple outcomes. However, it would be difficult to achieve all outcomes for all subject areas with less than 50 hours for *each* subject area. You will need to make reasoned choices of objectives, based on your knowledge of learner skills and abilities, and the time allotted for program delivery. Specific learning outcomes are identified within each module.

Before launching into the activities, take a few minutes to read the following paragraphs and review Appendix 1: Principles of Adult Learning and Helping Skills as well as Appendix 2: Introduction to Essential Skills.

Facilitating adult learning programs or working one-on-one with an adult learner starts with a basic understanding of adult learning principles. Take a minute and reflect on your experiences as an adult learner; you may find that what made your experience either positive or negative was directly related to the instructor's knowledge about adult learning principles. Specifically, being recognized for the wealth of experience you've accumulated, your desire to learn, and your independence as a learner.

Moreover, equally important to understanding adult learning is having a good grasp of communication process fundamentals that aid in moving your learner towards meeting goals. In addition, since the focus of the activities described in this guide is to increase the learners' literacy in some or all of the nine Essential Skills, refreshing your memory about the skills and the literacy levels will make for more effective facilitation.

Time: 15–20 hours

Module 1: Numeracy

Purpose

The main goals of mathematics education are to prepare learners to:

- Solve problems
- Communicate and reason mathematically
- Make connections between mathematics and its applications
- Become mathematically literate
- Appreciate and value mathematics
- Make informed decisions as contributors to society (Alberta Education Mathematics 10-12, 2008, p.2)

Objectives

Building solution pathways and lines of reasoning

- Search for and recognize entry points for solving a problem
- Plan a solution pathway or outline a line of reasoning
- Select the best solution pathway, according to given criteria
- Recognize and identify missing information that is required to solve a problem
- Select the appropriate mathematical technique(s) to use in solving a problem or line of reasoning

Abstracting problems

- Represent real-world problems algebraically
- Represent real-world problems visually
- Recognize the important and salient attributes of a problem

Furthering lines of reasoning

- Build steps of a line of reasoning or solution pathway, based on previous step or givens
- Complete the lines of reasoning of others
- Improve or correct a flawed line of reasoning

Mathematical fluency

- Manipulate and solve arithmetic expressions
- Transform and solve algebraic expressions
- Display data or algebraic expressions graphically

Evaluating reasoning and solution pathways

- Recognize flaws in others' reasoning
- Recognize and use counterexamples
- Identify the information required to evaluate a line of reasoning

(The GED Test: A Content Comparison, 2012).

Background information

Activity 1

Understanding what individual learners already know and have mastered is key to managing tight time constraints. The entry tests in the *Steck-Vaughn Complete Canadian GED Preparation Manual* are generally quick and easy to use and serve this purpose well. As noted above, you and the learners each need a copy of this manual.

This pretest is given on the first day of class. It is given with tight time lines. Learners are told that the purpose of this activity is for the facilitator to be able to know what they are able to do, so that the program can be tailored for their instructional needs. This pretest comes from the *Steck-Vaughn Complete Canadian GED Preparation Manual*. After learners complete the assessment, the teacher marks it, and compiles the information into a table so that strengths and weaknesses can be identified for individuals, groups and classes.

Activity 2

Simply stating the mathematical rules may be enough for teaching younger children, but adults usually want to know why. A demonstration of the rationale for the mathematical rules written on a whiteboard or using a Smart Board is usually enough for most adults. The key is to go through in a step-by-step manner. As with most mathematical process, one step builds on the next. It is imperative to check for learner understanding as these processes are being taught. It is time consuming, and may not be completed in one or two classes. Learners need time to practice, discuss and work with the material. When learners have a thorough understanding of integers and fractions, it makes teaching algebra so much less stressful. It is worth the time to build these foundational skills before moving on to algebra and statistics.

Activity 1

Pre-assessment: The springboard to effective programming

Goal (facilitator): To develop an understanding of what skills learners are bringing to class – a benchmark for individuals, groups and classes.

Goals (learner): To understand the types of skills, activities and formats that learners will be able to complete by the end of the course. To understand their own current level of skill in order to formulate an individual study program.

Materials

- *Steck-Vaughn Complete Canadian GED Preparation Manual Mathematics Part 1 Entry Test* (pages 52 to 58)
- *Steck-Vaughn Complete Canadian GED Preparation Manual Mathematics Part 2 Entry Test* (pages 59 to 64)
- *Steck-Vaughn Complete Canadian GED Preparation Manual Entry Test Performance Analysis Charts* (page 65)
- Pre-assessment Template (Alberta GED and Essential Skills Pre-assessment.xlsx)
- Calculator (Casio Fx 260)
- Pencils and erasers
- Stopwatch or timer

STEP-BY-STEP INSTRUCTIONS

1. Hand out Mathematics Part 1 Entry Test. Tell learners that they may use the Casio calculator, and the formula sheet to complete the assessment. Tell them that they will have 22 minutes to complete 12 questions, which are a sampling of the types of information that they will need to know for the GED exam.
2. Set timer for 22 minutes for Part 1. Have learners complete the test. Do not assist them in any way. Collect all tests as they are completed. Do not score in front of learners. Do not go over the questions in the first class. Review this information with the learners when you hand back the test and the test performance analysis sheets in the next class.
3. Hand out Mathematics Part 2 Entry Test. Tell learners that they may NOT use the Casio calculator, but CAN use the formula sheet to complete the assessment. Tell them that they will have 23 minutes to complete 13 questions which are a sampling of the types of information that they will need to know for the GED exam.
4. Set timer for 23 minutes for Part 2. Have learners complete the test. Do not assist them in any way. Collect all tests as they are completed. Do not score in front of learners. Do not go over the questions in the first class. Review this information with the learners when you hand back the test and the test performance analysis sheets in the next class.
5. Mark tests. Complete the test performance analysis sheets for each learner. Transfer that information to the Pre-assessment Template. Look for individual, group, and class strengths and weaknesses. Prioritize weak areas and then develop the instructional plan to address weak skill areas.

Activity 2

It's the law! Understanding the mathematical laws and rules governing integers, fractions, exponents, and order of operations

Goals

- Provide background knowledge and rationale so that learners may apply the rules governing addition, subtraction, multiplication and division of integers, fractions, exponents
- Understand and be able to apply the order of operations in equations

Materials

- Handout 1: *Integer Operations*
<http://amby.com/educate/math/integer.html>
- Handout 2: *Fractions*
<http://www.sosmath.com/algebra/fraction/frac8/frac8.html> (Permission granted for use in this publication)
- Handout 3: *Rules of Exponents*
<http://www.dummies.com/how-to/content/rules-of-exponents.html>
- Handout 4: *How to Multiply Exponents*
<http://www.dummies.com/how-to/content/how-to-multiply-exponents.html>
- Handout 5: *How to Divide Exponents*
<http://www.dummies.com/how-to/content/how-to-divide-exponents.html>
- Handout 6: *How to Add and Subtract with Powers*
<http://www.dummies.com/how-to/content/how-to-add-and-subtract-with-powers.html>
- Handout 7: *Order of Operations*
http://www.wyzant.com/resources/lessons/math/algebra/order_of_operations

Extra Math practice: <http://www.math-aids.com/>

Their description follows:

Math-Aids.Com provides free math worksheets for teachers, parents, learners, and home schoolers. The math worksheets are randomly and dynamically generated by our math worksheet generators. This allows you to make an unlimited number of printable math worksheets to your specifications instantly.

The website contains over 87 different math topics with over 1074 unique worksheets. They may be customized to fit your needs and may be printed immediately or saved for later use. These math worksheets are randomly created by our math worksheet generators, so you have an endless supply of quality math worksheets at your disposal. These high quality math worksheets are delivered in a PDF format and includes the answer keys. Our math worksheets are free to download, easy to use, and very flexible. A detailed description is provided in each math worksheets section.

STEP-BY-STEP INSTRUCTIONS

1. Give one handout at a time. Explain and demonstrate each process or rule. Provide additional examples and relate each process or rule to an everyday situation or workplace example.
2. Provide guided practice opportunities, either in independent work or small group work, for learners to demonstrate understanding. Math-Aids.com is a free tool that can generate customized worksheets useful in guided practice.
3. As a group, go through the guided practice, showing the processes and rules at work. Demonstrate your mathematical thinking, by verbalizing your solution process as you write it on the board or Smart Board. Allow students to challenge and show alternate methods/processes of arriving at a correct solution. Quite often the questioning and the discussions in guided practice give a good indication of students' ability or understanding of the process in review. This discussion and questioning allows instructors to provide immediate corrective feedback for students.

Outcomes/indicators

Outcomes for this module.

| GED 2002/GED 2014/Essential Skills Learner Outcomes Comparison | | |
|---|--|--|
| Math Reasoning | | |
| GED 2002 | GED 2014 | Essential Skills |
| Represent and use numbers in a variety of equivalent forms (integer, fraction, decimal, percent, exponential, and scientific) in a real world and mathematical problem situations | 0.1.a. Order fractions and decimals on a number line 0.1.c Apply rules of exponents in numerical expressions with rational exponents to write equivalent expression with rational exponents 0.3.d Solve two-step, arithmetic, real world problems involving percent. Examples include but are not limited to: simple interest, tax, mark ups/down, gratuities and commissions, percent increase and decrease | |
| Represent, analyze and apply whole numbers, decimals, fractions, percent, ratios, proportions, exponents, roots and scientific notation in a wide variety of situations | 0.1.a Order fractions and decimals, including on a number line 0.1.b Apply number properties involving multiples and factors, such as using the least common multiple, greatest common factor, or distributive property to rewrite numeric expressions 0.2.a Perform addition, subtraction, multiplication and division on rational numbers 0.2.b Perform computations and write numerical expressions with squares and square roots of positive, rational numbers 0.2.c Perform computations and write numerical expressions with cubes and cube roots of positive, rational numbers 0.2.e Solve one-step or multi-step arithmetic, real world problems involving the four operations with rational numbers, including those involving scientific notation 0.3.c Solve multistep arithmetic real world problems using ratios, proportions including those that require units of measure 0.3.d Solve two step, arithmetic, real world problems involving percent. Examples include but are not limited to: simple interest, tax, mark ups/downs, gratuities and commissions and percent increase/decrease | Read, write, count, round off, add, subtract, multiply and divide whole numbers, decimals and fractions. Read, write, add, subtract, multiply and divide integers. Use square roots, powers, scientific notation and significant digits. Read and write percentages. Calculate the percentage one number is of another. Calculate a percentage of a number. |
| Recognize equivalencies and order relations for whole numbers, fractions, decimals, integers, and rational numbers | 0.1.a. Order fractions and decimals, including on a number line | Convert between fractions, decimals and percentages |
| Select the appropriate operations to solve problems | Not assessed on the 2014 test | |
| Relate basic arithmetic operations to one another | Not assessed on the 2014 test | |
| Calculate mentally, with pencil and paper, and with a scientific calculator using whole numbers, fractions, decimals and integers | 0.2.a. Perform addition, subtraction, multiplication and division on rational numbers | |
| Use estimation to solve problems and assess the reasonableness of an answer | Not assessed on the 2014 test | |
| Model and solve problems using the concepts of perpendicularity, parallelism, congruence, and similarity of geometric figures | Not assessed on the 2014 test | Apply geometric concepts such as parallelism, perpendicularity and tangents |

| GED 2002 | GED 2014 | Essential Skills |
|--|---|---|
| Use spatial visualization skills to describe and analyze geometric figures and translations/rotations/dilations of geometric figures | Not assessed on the 2014 test | |
| Use the Pythagorean Theorem to model and solve problems | 0.4.a Use the Pythagorean Theorem to determine unknown side lengths in a right triangle | |
| Not assessed | Not assessed | Use trigonometry to determine the size of an unknown side or angle of a triangle |
| Find, use, and interpret the slope of a line, the y-intercept of a line, and the intersection of two lines | <p>A.5.b Determine the slope of a line from a graph, table or equation</p> <p>A.5.c Interpret unit rate as the slope in a proportional relationship</p> <p>A.5.d Graph two-variable equations</p> <p>A.5.a For a function that models a linear or nonlinear relationship between two quantities, interpret key features of graphs and tables in terms of quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts, intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behaviour, periodicity</p> <p>A.6.a Write the equation of a line with a given slope through a single point</p> <p>A.6.c Use slope to identify parallel and perpendicular lines and to solve geometric problems</p> | |
| Use coordinates to design and describe geometric figures | A.5.a Locate points in the coordinate plane | |
| Identify and select appropriate units of metric and customary measures | Not assessed on the 2014 test | Convert between imperial and metric (SI) measurements. Convert to another unit within a measurement system. |
| Convert and estimate units of metric and customary measure (all conversions within systems) | <p>0.3.c Solve multistep, arithmetic, real-world problems using ratios or proportions including those that require converting units of measure</p> <p>0.4.a Compute the area and perimeter of triangles and rectangles. Determine the length of triangles and rectangles when given area or perimeter</p> <p>0.4.b Compute the area and circumference of circles. Determine the radius or diameter when given circumference or area</p> <p>0.4.c Compute the perimeter of a polygon. Given an arithmetic formula, compute the area of a polygon. Determine side lengths of the figure when given the perimeter or area.</p> <p>0.4.d Compute the perimeter and area of 2-D composite geometric figures, which could include circles, given the geometric formulas as needed</p> <p>0.5.a When given geometric formulas, compute volume and surface area of rectangular prisms. Solve for height or side lengths, when given volume or surface area</p> <p>0.5.b When given geometric formulas, compute volume and surface area of cylinders. Solve for height, radius, diameter when given volume or surface area</p> <p>0.5.c When given geometric formulas, compute volume and surface area of right prisms. Solve for side lengths or height when given volume or surface area</p> <p>0.5.d When given geometric formulas, compute volume and surface area of pyramids and cones. Solve for side lengths, height, radius or diameter when given surface area or volume.</p> <p>0.5.e When given geometric formulas, compute volume and surface area of spheres. Solve for radius or diameter when given the surface area</p> | Calculate averages and rates other than percentages, proportions or ratios |

| GED 2002 | GED 2014 | Essential Skills |
|--|---|--|
| Solve and estimate solutions to problems involving length, perimeter, area, surface area, volume, angle measurement, capacity, weight, and mass | 0.5.f Compute surface area and volume of composite 3-D geometric figures, given geometric formulas as needed | Calculate areas, perimeters and volumes |
| Use uniform rates in problem situations | 0.2.a Solve one-step or multi-step arithmetic, real-world problems involving the four operations with rational numbers, including those involving scientific notation 0.3.a Compute unit rates. Examples include, but are not limited to; unit pricing, constant speed, persons per square mile/km., BTU/ft ³ 0.3.b Use scale factors to determine the magnitude of a size change. Convert between actual drawings and scale drawings 0.3.c Solve multistep, arithmetic, real-world problems using ratios or proportions including those that require converting units of measure | Use a rate comparing two quantities with different units. Use a ratio comparing two quantities with the same units. Use a proportion comparing two ratios or rates |
| Read and interpret scales, meters, and gauges | Not assessed on the 2014 test | |
| Predict the impact of changes in linear dimension on the perimeter, area, and volume of figures | Not assessed on the 2014 test | |
| Construct, interpret and draw inferences from tables, charts and graphs. Make inferences and convincing arguments based on data analysis Represent data graphically in ways that make sense and are appropriate to the context Use an informal line of best fit to make predictions from data | 0.6.a Represent, display and interpret categorical data in bar graphs or circle graphs 0.6.b Represent, display and interpret data involving one variable plots on the real number line including dot plots, histograms, and box plots 0.6.c Represent, display and interpret data involving two variables in tables and the coordinate plane including scatter plots and graphs | |
| Evaluate arguments based on data analysis, including distinguishing between correlation and causation | Not assessed on the 2014 test | |
| Apply measures of central tendency (mean, median, mode) and analyze the effect changes in data on these measures | 0.7.a Calculate the mean, median, mode and range. Calculate missing data value, given the average and all the missing data values but one, as well as calculating the average, given the frequency counts of all the data values, and calculating a weighted average | |
| Apply and recognize sampling and bias in statistical claims | Not assessed on the 2014 test | |
| Make predictions based on experimental or theoretical probabilities, including listing probable outcomes | 0.8.a Use counting techniques to solve problems and determine combinations and permutations 0.8.b Determine the probability of simple and compound events | Use statistics and probability to draw conclusions |
| Compare and contrast different sets of data on the basis of measures of central tendency and dispersion (range and standard deviation) | Not assessed on the 2014 test | |

| GED 2002 | GED 2014 | Essential Skills |
|--|--|--|
| Analyze and represent situations involving variable quantities with tables, graphs, verbal descriptions, and equations | <p>A.2.b Solve real-world problems involving linear equations</p> <p>A.5.d Graph two-variable equations</p> <p>A.5.a For a function that models a linear or nonlinear relationship between two quantities, interpret key features of graphs and tables in terms of quantities, and sketch graphs showing key features of graphs and tables in terms of quantities, and sketch graphs showing key features given verbal descriptions of the relationship. Key features include: intercepts; interval where the function is increasing, decreasing, positive or negative; relative maximums and minimums; symmetries; end behaviour, and periodicity</p> <p>A.7.a Compare two different proportional relationships represented in different ways. Examples include, but not limited to: compare a distance-time graph to a distance-time equation to determine which of the two objects has a greater speed</p> <p>A.7.d Compare properties of two linear or quadratic functions each represented in a different way (algebraically, numerically in tables, graphically or by verbal description). Examples include, but not limited to: given a linear function represented by an algebraic expression, determine which function has the greater rate of change</p> | Solve problems using equations with one known quantity. Use formulas by inserting quantities. Solve quadratic equations. |
| Recognize that a variety of problem situations may be modeled by the same function or type of function (e.g. $y=mx+b$, $y=ax^2$, $y=ax$, $y=1/x$). | <p>A.2.c Write one-variable and multi-variable linear equations to represent context</p> <p>A.4.b Write one-variable quadratic equations to represent context</p> | |
| Convert between different representations, such as tables, graphs, verbal descriptions and equations | <p>A.2.c Write one-variable and multi-variable linear equations to represent context</p> <p>A.4.b Write one-variable quadratic equations to represent context</p> <p>A.5.d Graph two-variable linear equations</p> | |
| Create and use algebraic expressions and equations to model situations and solve problems | <p>A.1.a Add, subtract, factor, multiply and expand linear expressions with rational coefficients</p> <p>A.1.c Write linear expressions as part of word-to-symbol translations or to represent common settings</p> <p>A.1.d Add, subtract, multiply polynomials, including multiplying two binomials, or divide factorable polynomials</p> <p>A.1.g Write polynomial expressions as part of word-to-symbol translations or to represent common settings</p> <p>A.1.h Add, subtract, multiply and divide rational expressions</p> <p>A.1.j Write rational expressions as part of word-to symbol translations or to represent common settings</p> <p>A.2.b Solve real-world problems using linear equations</p> <p>A.2.c Write one-variable and multi-variable linear equations to represent context</p> <p>A.2.d Solve a system of two simultaneous linear equations by graphing, substitution, or linear combination. Solve real-world problems leading to a system of linear equations</p> <p>A.4.a Solve quadratic equations in one variable with rational coefficients and real solutions, using appropriate methods (e.g. quadratic formula, completing the square, factoring, inspection)</p> <p>A.4.b Write one-variable quadratic equations to represent context.</p> | |
| Convert between different representations, such as tables, graphs, verbal descriptions and equations. | <p>A.2.c Write one-variable and multi-variable linear equations to represent context</p> <p>A.4.b Write one-variable quadratic equations to represent context</p> <p>A.5.d Graph two variable linear equations</p> | |

| GED 2002 | GED 2014 | Essential Skills |
|---|---|--|
| Evaluate formulas | A.1.b Evaluate linear expressions by substituting integers for unknown quantities A.1.a Evaluate polynomial expressions by substituting integers for unknown quantities A.1.i Evaluate rational expressions by substituting integers for unknown quantities A.7.c Evaluate linear and quadratic functions for values in their domain when represented using function notation | |
| Solve equations, including first degree, quadratic, power, and systems of linear equations | A.2.a Solve one-variable linear equations with rational numbers coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms or equations with coefficients represented by letters A.2.b Solve real-world problems using linear equations A.2.d Solve a system of two simultaneous linear equations by graphing, substitution, or linear combination. Solve real-world problems leading to a system of linear equations A.4.a Solve quadratic equations in one variable with rational coefficients and real solutions, using appropriate methods (i.e. quadratic formula, completing the square, factoring, inspections) A.4.b Write one variable quadratic equations to represent context | Solve problems using equations with one unknown quantity. Use formulas by inserting quantities. Solve quadratic equations. |
| Recognize and use direct and indirect variation | Not assessed on the 2014 test | |
| Analyze tables and graphs to identify and generalize patterns and relationships | A.2.b Solve real-world problems involving linear equations A.5.d Graph two-variable linear equations | |
| Analyze and use functional relationships to explain how a change in one quantity results in a change in another quantity, including linear, quadratic and exponential functions | Not assessed on the 2014 test | |
| | 0.1.d Identify absolute value of a rational number as its distance from 0 on the number line and determine the distance between two rational numbers on the number line, including the absolute value of their difference | |
| | 0.2.d Determine when a numerical expression is undefined | |
| | A.1.f Factor polynomial expressions | |
| | A.3.a Solve linear inequalities in one variable with rational number coefficients | |
| | A.3.b Identify or graph the solution to a one variable linear inequality on a number line | |
| | A.3.c Solve real-world problems involving inequalities | |
| | A.3.d Write linear inequalities in one variable to represent context | |
| | A.7.b Represent or identify a function in a table or graph as having exactly one output (one element in the range) for each input (each element in the domain). | |

Compiled from The GED Test: A Content Comparison; Human Resources and Skills Development Canada: What are Essential Skills; and Human Resources and Skills Development Canada: Trades Math Workbook – Math Foundations

Resources

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Marcus, N. Summary of Rules. *S.O.S. Math*. Retrieved on April 21, 2015 from <http://www.sosmath.com/algebra/fraction/frac8/frac8.html>

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Time: 15–20 hours

Module 2: Writing

Purpose

Learning the foundational skills of communication enhances confidence, builds personal identity and enables individuals to create and sustain meaningful relationships. Becoming successful communicators at home, at work and in the community enables individuals to experience personal satisfaction and become responsible, contributing citizens and lifelong learners. (Alberta Education ELA 10-4, 2006, p.6)

Objectives

Reading

- Draw specific comparisons between two texts
- Distinguish between valid arguments and faulty reasoning
- Distinguish between supported and unsupported claims
- Make inferences based on assumptions made by the author

Reasoning through Language Arts – Reading

- Read closely text that is:
 - More complex than in the 2002 Series
 - Greater in length than in the 2002 Series
- Determine what is explicitly stated
- Make logical inferences based on evidence
- Make inferences about characters

Writing

- Draw relevant and sufficient evidence from the texts
- Produce a response that:
 - Includes specific evidence
 - Uses an effective organizational structure
 - Uses appropriate vocabulary
 - Applies standard conventions of English

Reasoning through Language Arts – Writing

- Provide real-world opportunities for test-takers to develop an argument and support ideas with text-based evidence
- Integrate reading and writing skills
- Score responses using a new multi-dimensional rubric

Reasoning through Language Arts – Language

- Demonstrate command of conventions of standard English
- Recognize the errors in the responses that are not correct
- Identify the grammatically correct option
- Edit to eliminate run-on sentences, fused sentences, or sentence fragments

(The GED Test: A Content Comparison, 2012).

Background information

Activity 1

Understanding what individual learners already know and have mastered is key to managing tight time constraints. The entry tests in the *Steck-Vaughn Complete Canadian GED Preparation Manual* are generally quick and easy to use and serve this purpose well. As noted previously, you and the learners each need a copy of this manual.

This pretest is given on the first day of class. It is given with tight time lines. Learners are told that the purpose of this activity is for the facilitator to be able to know what they are able to do, so that the program can be tailored for their instructional needs. This pretest comes from the *Steck-Vaughn Complete Canadian GED Preparation Manual*. After learners complete the assessment, the teacher marks it, and compiles the information into a table so that strengths and weaknesses can be identified for individuals, groups and classes.

Activity 2

Essay writing is one of the most challenging tasks many learners face. English Language Learners (ELL) usually find this task to be very intimidating. They may still struggle with the spoken structure of the English language, so written conventions are a level of complexity that they may see as beyond their skill level. In ELL populations with minimal written text in their native language, such as the LGM group, writing conventions and structures are extremely foreign concepts. Writing tasks can quickly overwhelm them. The attention to detail and content seem to be simultaneous and too rigorous for many learners. Take the process slowly. Build on successive steps. Explain the marking GED rubric in great detail so learners understand what is expected, and when possible, provide exemplars as evidence.

Activity 1

Pre-assessment: The springboard to effective programming

Goal (facilitator): To develop an understanding of what skills learners are bringing to class – a benchmark for individuals, groups and classes.

Goals (learner): To understand the types of skills, activities and formats that learners will be able to complete by the end of the course. To understand their own current level of skill in order to formulate an individual study program.

Materials

- *Steck-Vaughn Complete Canadian GED Preparation Manual* Language Arts Part 1 Entry Test (pages 13 to 20)
- Entry Test Performance Analysis Language Arts – Writing (page 21)
- *Steck-Vaughn Complete Canadian GED Preparation Manual* Language Arts Writing Part 2 Entry Test (pages 22 to 23)
- *Steck-Vaughn Complete Canadian GED Preparation Manual* Scoring an Essay (page 185)
- *Steck-Vaughn Complete Canadian GED Preparation Manual* Language Arts Reading Entry Test (pages 42 to 50)
- *Steck-Vaughn Complete Canadian GED Preparation Manual* Entry Test Performance Analysis Language Arts – Reading (page 51)
- Pens and paper
- Stopwatch or timer
- Pre-assessment Template (Alberta GED and Essential Skills Pre-assessment.xlsx)

STEP-BY-STEP INSTRUCTIONS

1. Hand out *Steck-Vaughn Complete Canadian GED Preparation Manual* Language Arts Writing Part 1 Entry Test. Tell learners that they will have 37.5 minutes to complete 25 questions which are a sampling of the types of information that they will need to learn and know for the GED exam.
2. Set timer for 37.5 minutes for Part 1. Have learners complete the test. Do not assist them in any way. Collect all tests as they are completed. Do not score in front of learners. Do not go over the questions in the first class. Review this information with the learners when you hand back the test and the test performance analysis sheets in the next class.
3. Hand out *Steck-Vaughn Complete Canadian GED Preparation Manual* Language Arts Part 2 Entry Test. Tell learners that they will have 45 minutes to complete an essay topic similar to those on the GED exam.

4. Set timer for 45 minutes for Part 2. Have learners complete the test. Do not assist them in any way. Collect all tests as they are completed. Do not score in front of learners. Do not go over the questions in the first class. Review this information with the learners when you hand back the test and the essay scoring guide in the next class.
5. Hand out *Steck-Vaughn Complete Canadian GED Preparation Manual* Language Arts Reading entry test. Tell learners that they will have 32.5 minutes to complete 20 questions which are a sampling of the types of information that they will need to learn and know for the GED exam.
6. Set the timer for 32.5 minutes for the Reading test. Have learners complete the test. Do not assist them in any way. Collect all tests as they are completed. Do not score in front of learners. Do not go over the questioning in this class. Review this information with the learners when you hand back the test and the test performance analysis sheets in the next class.
7. Mark tests. Complete the test performance analysis sheets for each learner. Transfer that information to the Pre-assessment Template. Look for individual, group, and class strengths and weaknesses. Prioritize weak skill areas and then focus instruction to address the areas in need of development.

Activity 2

Write on!

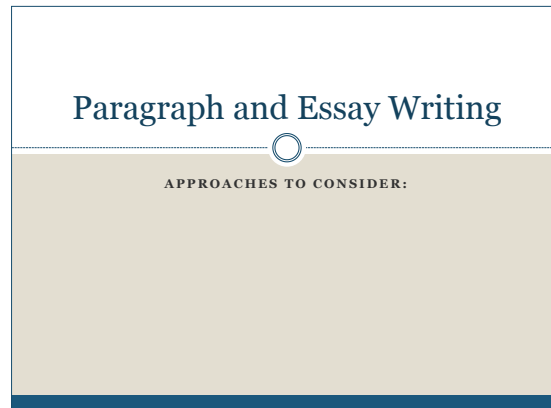
Goals: This activity covers writing paragraphs and essays. There are several lessons associated with this activity and PowerPoint presentation. The activity covers most of the goals listed for writing effective paragraphs and essays. It does NOT cover goals for editing and revising, although these processes are referred to.

Materials

- Handout 8: *The Hamburger 5 Paragraph Essay Model*
http://mrmulloy.weebly.com/uploads/1/0/9/3/10937155/burger_essay.pdf
- Handout 9: *Powerpoint Slides: GED Paragraph and Essay Writing*
- PowerPoint (Alberta GED and Essential Skills Writing.pptx)
- Visual organizers:
Freemind (http://freemind.sourceforge.net/wiki/index.php/Main_Page)
XMind (<https://www.xmind.net/>)

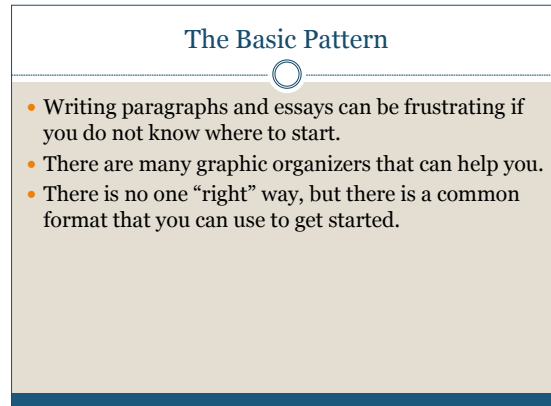
STEP-BY-STEP INSTRUCTIONS

Note: The following 21 slides instruct learners to write paragraphs and essays. Under each slide are specific instructions. Depending on your group, your room setup, access to the internet and your preference you may want to copy each slide for the learner to work with during class or you may want to project the PowerPoint presentation. Handout 9: *PowerPoint Slides: GED Paragraph and Essay Writing* references the slides.

Slide 1

Paragraph and Essay Writing

APPROACHES TO CONSIDER:

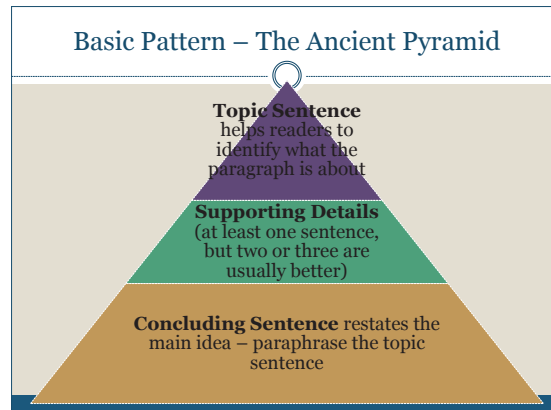
Slide 2

The Basic Pattern

- Writing paragraphs and essays can be frustrating if you do not know where to start.
- There are many graphic organizers that can help you.
- There is no one “right” way, but there is a common format that you can use to get started.

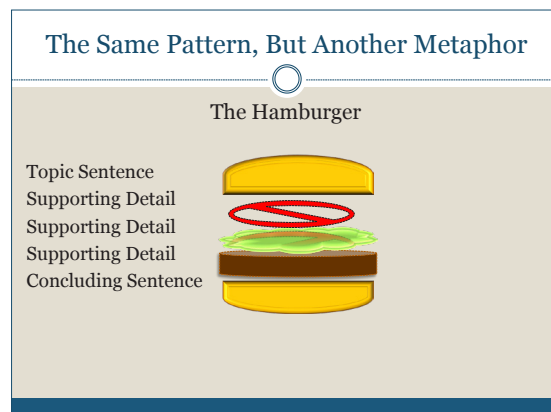
Discuss the different types of graphic organizers learners may have seen. It might be worthwhile to bring an assortment of different graphic organizers to show learners. Graphic organizer can include webs, outlines, KWL charts (K – what I know, W – what I want to know, L – what I have learned) and point-form notes from brainstorming activities. If learners have web access there are many graphic organizers they can access for free. All they need to do is search. Caution: many apps end up requiring the user to pay if they want to print or copy. This could be a lesson all unto itself – depending on the needs of the learners.

Slide 3



The secret to good essays is good paragraph construction. For that reason, paragraph construction and essay writing have not been separated. Once learners understand paragraph construction, it is relatively easy for them to see the parallel to good essay construction. Constructing good paragraphs is usually a lesson by itself. Slides 3 and 4 of this presentation provide some visual metaphors for learners to use to guide them in their understanding of paragraph. Go through slide 3 and 4 and compare how the same information is presented, just differently. A good paragraph requires a topic sentence, supporting details in sentences, and a concluding sentence.

Slide 4



The hamburger visual metaphor is popular at the moment in schools across most grades. The top bun is the topic sentence; the bottom bun, the concluding sentence. Both are similar in nature – usually just restating each other. The tomato is a supporting statement. The lettuce can be another supporting statement, an example, or a counter-position (rebuttal). The patty is another supporting statement. If a rebuttal or counter position is taken, the patty must be a strong statement of support. If the lettuce statement is an example, then the patty statement should not be another example, as that only leaves one statement of support (the tomato) with two examples. You can distribute Handout 8: *The Hamburger 5 Paragraph Essay Model* at this time.

Slide 5

Topic Sentence

○

The topic sentence determines the content of the paragraph.

The topic sentence must guide readers and capture their attention at the same time.

Most paragraphs have their topic sentence as the first sentence, *HOWEVER*, this is not always the case.

Explore your own writing style to see what works for you

National Geographic magazines are great resources for teaching learners about attention-grabbing topic sentences. They tend to follow an easy recognizable pattern of paragraph construction, and the language used is often effective for grabbing readers' attention. If learners are generally weak at constructing topic sentences, use National Geographic magazines (or Canadian Geographic) to demonstrate topic sentences in action. Have learners identify topic sentences and analyse the choice of vocabulary the writers have used to capture their attention as readers. Then have learners create an alternative topic sentence for that paragraph. Come back as a class and read each person's topic sentence aloud. Discuss the merits of each learner's topic sentence – what worked well and what might have worked better.

Slide 6

Supporting Details

○

Supporting detail sentences are not any less important than topic sentences. They just play a different role.

Sentences containing supporting details may contain observations, comments or insights that are relevant to the main idea.

They are the “meat and potatoes,” or, “get down to business” part of the paragraph.

This area can be difficult for learners, especially if they are English Language Learners and/or newcomers to Canada. This requires learners to demonstrate their background knowledge. Brainstorming or listing ideas as a group will help reluctant learners to understand and make connections so that they can understand what is meant by supporting details.

Slide 7

| Concluding Sentence |
|--|
| <p>The concluding sentence reinforces the whole paragraph.</p> <p>It does not leave the reader wondering what the paragraph was about. Your readers know for certain what the “flavour” of the paragraph is.</p> <p>Quite often the concluding sentence in the introductory paragraph in many reports contains an explicit thesis statement.</p> |

Concluding sentences often lead into a lesson about paraphrasing and/or summarizing. For many learners, the redundancy or repeating information may appear to be a waste of time and effort. They need to see a concluding sentence as an ending to a story.

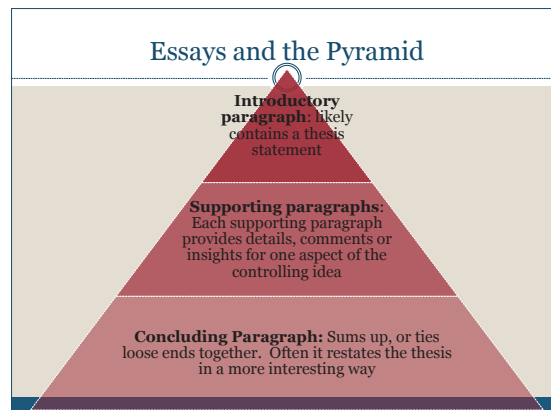
Slide 8

| Essays – An Extension of the Same Metaphors |
|--|
| <p>The same basic metaphors of the pyramid and hamburger can be applied to writing essays.</p> <p>Essays usually contain an introductory paragraph, at least two or three (minimum) supporting paragraphs, and a concluding paragraph.</p> |

Once learners understand how to write a good paragraph, demonstrate how essay writing is very similar to good paragraph construction. The major issue that most learners encounter is that they often assume that first drafts need to be of publication quality.

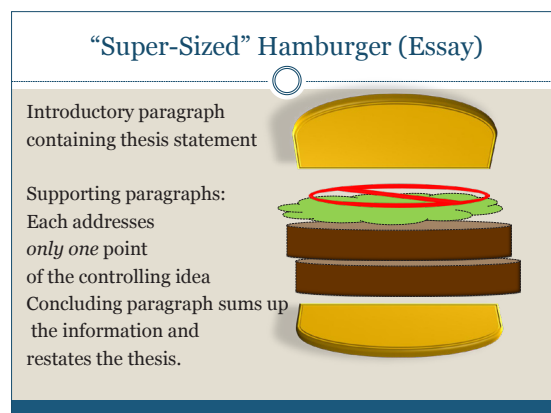
Discussion point: It is important for learners to understand the purpose of drafts and the difference between revision and editing. While drafts may mean more work, it often allows learners who are anxious about the writing process find ways to cope and manage their writing task. Have the discussion about the differences between editing and revising with the learners and help learners to understand why drafts are a necessary component to effective writing.

Slide 9



Have learners identify ways in which the pyramid paragraph and pyramid essay metaphors are similar and different. Attention will likely fall on “What is a thesis statement?” Let learners try to define what a thesis statement is based on their background knowledge of topic sentences.

Slide 10



Have learners compare the “Super-Sized” Hamburger Essay Model to the Hamburger 5 Paragraph Essay model. What are the similarities? Differences? Why are the differences necessary? What do those differences mean to the writer?

Slide 11

Thesis Statements

The thesis statement or main claim must be debatable

An argumentative or persuasive piece of writing must begin with a debatable thesis or claim. In other words, the thesis must be something that people could reasonably have **differing opinions** on. If your thesis is something that is generally agreed upon or accepted as fact then there is no reason to try to **persuade** people (OWL, 2013).

Have learners define the terms *debate*, *opinion* and *persuade*. Correct for any misunderstandings or assumptions. Have a mock debate over a silly topic, for example, blondes have more fun! Have learners try to persuade each other that one vehicle brand is better than another, for example, Fords are better than Hondas. Discover differing opinions on topics such as *best school subject* or *best ice cream flavour*. Have learners analyse what different strategies they used when debating vs. persuading vs. differing opinion. Discuss how those strategies can be used in their writing.

Slide 12

Thesis Statements

Example of a non-debatable thesis statement:

- Pollution is bad for the environment

Example of a debatable thesis statement:

- At least 25 percent of the federal budget should be spent on limiting pollution. (Owl, 2013)

Discussion point!
What makes the second statement debatable while the first is not?

The discussion point is really important. It will tie into the previous activity about debates, persuading, and differing opinions.

Slide 13

Thesis Statements

The thesis needs to be narrow (in focus)
 Generally the narrower the thesis the more effective your argument will be. Your thesis or claim must be supported by evidence. The broader your claim is, the more evidence you will need to convince readers that your position is right (Owl, 2013).

This is just an information slide for learners and facilitators. The activity is to follow on the next slide.

Slide 14

Thesis Statements

Example of a thesis that is too broad:

- Drug use is detrimental to society.

Example of a narrow or focused thesis:

- Illegal drug use is detrimental because it encourages gang violence. (Owl, 2013)

Discussion point!
 What makes the second statement more focused than the first?

The *Discussion point* is critical. Narrowing a focus can be an art form. The major reason the second statement is more focused than the first is because of the “because...” statement. The “because...” statement acts as an arena to contain the discussion – written or verbal.

Slide 15

Other methods to consider: Outlining and Mind Mapping
(Webbing)

○

Outlining and Mind Mapping (Webbing) are also great ways to organize information before you begin to write. They can often help to sort the information into neatly focused paragraphs.

There are many good (and free!) outlining and mind mapping (webbing) apps and websites available to assist you with organizing your writing.

This was previously discussed, but may be a good time to review. If at all possible, have learners find an outlining or mind-mapping website or app. Let them “play” with it to see how it can assist them with organizing their writing ideas. Facilitators may want to provide a topic or writing prompt to help focus learners’ attention on the utility of the web site or app.

Both Freemind (http://freemind.sourceforge.net/wiki/index.php/Main_Page) and XMind (<https://www.xmind.net/>) are good and have free versions.

Slide 16

Supporting Paragraphs


○

Each supporting paragraph should “tackle” only one point of the thesis statement. Think of being a lawyer in a court room – how would you “defend” your thesis if it were on trial? What information could you use to make your point? Are some points more important than others? Is there a logical order to the information you are presenting (If not, there should be!)?

Use National Geographic or Canadian Geographic magazines to help learners identify and analyze supporting paragraphs. Ask learners to determine how each supporting paragraph supports the essay/article. Discuss their findings in class. This may bring up the use of transitional devices that help to support the sequence of logic in the essay. (Transitional devices are the next lesson).

Slide 17


Transitional Devices – the Cheese and Mustard that Hold it Together




A hamburger that is sloppily put together is difficult to eat. The insides fall out of the bun and make a mess! So it is with the essay. We need to put the essay together so that each part sticks to the other. We do this with transitional devices.

Information slide only. The activity is on next slide.

Slide 18

What are Transitional Devices? 



Transitional devices are words and phrases that link ideas, sentences and paragraphs. They help the essay (or paragraph) flow easily.

Words and phrases like: therefore, because, however, albeit, also, in addition to, as a result, furthermore, hence, in conclusion, to reiterate....

What words or phrases have you used, read or heard to help essays and conversations flow?

Facilitators may want to do an internet search for lists of transitional words and phrases to hand out as supplementary material, or facilitators may have learners brainstorm a list of transitional words they may have encountered in their everyday life or workplace experience. Discuss how the use of transitional devices helps to make writing more clear and easy to follow. Facilitators may want to use National Geographic or Canadian Geographic once again for learners to identify and analyze how transitional devices are used and the effects they have on the essay/article.

Slide 19**Let's Write!**

Take some time to organize your material and your thoughts. Use tools such as outlines and mind maps or webs to help you.

Write your first draft. Do not shoot for publication quality in your first draft.

If you are using information directly from someone, give them credit.

Paraphrase as much information as you can. Make sure you know the difference between paraphrasing and plagiarism

Discuss what plagiarism is and the consequences for plagiarising material. Practise paraphrasing by picking an article from a newspaper or magazine. This may lead into a discussion on when to quote and when not to quote. Try to pick an article that has at least one paragraph for every learner to paraphrase. Assign each learner one paragraph to paraphrase, and then reconstruct the article with the paraphrased paragraphs. Discuss the similarities and differences, and why they occurred, between the original article and the paraphrased article.

Slide 20**It's a Little Drafty (pardon the pun)!**

Revise in your second draft. Add material you may have missed, and delete information that has been repeated (unless you are going for repetition as an effect).

Edit for spelling, grammar and general flow in your third draft.


Polish if necessary in your fourth draft.

Take a draft essay and have learners revise the essay. Drafts can be found online. Explain the difference between revision and editing. Then have learners edit the revised essay. It might be beneficial to use a checklist like C.O.P. S. (Capitalization, Overall Appearance, Punctuation, and Spelling) or C.U.P.S (Capitalization, Usage, Punctuation, and Spelling) to serve as guide. Both of these checklists are easy to find using an internet search of those acronyms.

Slide 21

Celebrate

Congratulations!
You are a writer!



Outcomes/indicators

Outcomes for this module.

| GED 2002/GED 2014/Essential Skills Learner Outcomes Comparison | | |
|--|---|---|
| Reading | | |
| GED 2002 | GED 2014 | Essential Skills |
| Restate or paraphrase information | R.2.1. Comprehend explicit details and main ideas in text | |
| Summarize main ideas | R.2.2 Summarize main ideas in text | Understanding materials written in sentences or paragraphs |
| Explain the primary implication of the text | R.2.4 Infer implied main ideas in paragraphs or whole texts | Finding, understanding or entering information in various forms of documents, such as tables or forms |
| Transfer concepts and principles from reading to a new context | R.2.7 Make evidence-based generalizations or hypotheses based on details in text, including clarifications, extensions, or applications of main ideas to new situations | |
| Draw conclusions and understand consequences | R. 2.8 Draw conclusions or make generalizations that require synthesis of multiple main ideas in text | |
| Make inferences and recognize unstated assumptions | R. 2.3 Make sentence-level inferences about details that support main ideas | Understanding materials written in sentences or paragraphs |
| Identify elements of style and structure and interpret the organizational structure or pattern in a text | R.5.4 Analyze how the structure of a paragraph, section, or passage shapes meaning, emphasizes key ideas, or supports an author's purpose | |
| Identify tone, word usage, characterization, use of detail and example, and figurative language | R.4.3/L.4.3 Analyze the impact of specific words, phrases, or figurative language in texts, with a focus on author's intent to convey information or construct an argument R.3.1 make inferences about plot/sequence of events, characters/people, settings, or ideas in texts | |
| Identify cause and effect relationships | R. 3.4 Infer relationships between ideas in a text (e.g. an implicit cause and effect, parallel, or contrasting relationship) | |
| Distinguish conclusions from supporting statements | R.2.5 Determine which detail(s) supports a main idea | |
| Interpret tone, point of view, style or purpose of a work | R.6.1 Determine an author's point of view or purpose of a text | |
| Make connections among parts of a text and integrate information from outside a passage with elements within the passage | Not assessed on GED 2014. Refer to R.5, R.7 and R.9 for how the 2014 test assesses related content | |
| Not assessed | R.3 Analyze how individuals, events, and ideas develop and interact over the course of a text | |
| Not assessed | R.5 Analyze the structure of texts, including how specific sentences or paragraphs relate to each other and the whole | |
| Not assessed | R.6 Determine an author's purpose or point of view in a texts and explain how it is conveyed and shapes the content and style of a text | |
| Not assessed | R.8 Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence | |
| Not assessed | R. 7/R.9 Analyze how two or more texts address similar themes or topics | |

| Language | | |
|--|---|---|
| GED 2002 | GED 2014 | Essential Skills |
| Create effective text divisions (within or among paragraphs) Combine paragraphs to form a more effective document Form new paragraphs within multi-paragraph documents Create topic sentences | L.1.9 Edit to ensure effective use of transitional words, conjunctive adverbs, and other words and phrases that support logic and clarity Note: paragraph development and organizational skills are measured through Trait 2 of the Extended Response Scoring Rubric and will not appear in editing tasks on the 2014 RLA Test | Communicating by arranging words, numbers and symbols on paper or a computer screen |
| Edit to eliminate sentence fragments, run-on sentences, and comma splices | L.2.2 Edit to eliminate run-on sentences, fused sentences or sentence fragments | |
| Edit to eliminate improper coordination and subordination, modification, and parallelism | L.1.5 Edit to eliminate dangling or misplaced modifiers or illogical word order (e.g., correctly use to meet almost all requirements instead of to almost meet all requirements). L.1.6 Edit to ensure parallelism and proper subordination and coordination | |
| Edit to eliminate subject-verb agreement (including agreement in number, interrupting phrases, and inverted structure) | L.1.2 Edit to correct errors in straightforward subject-verb agreement L.1.7 Edit to correct errors in subject-verb or pronoun antecedent agreement in more complicated situations (e.g., with compound subjects, interceding phrases, or collective nouns). | |
| Edit to eliminate verb tense errors (including sequence of tenses, word clues to tense in sentences, word clues to tense in paragraphs, and verb form) | Note: This skill is assessed on the Extended Response Scoring Rubric Trait 3 only | |
| Edit to eliminate pronoun reference errors (including incorrect relative pronouns, pronoun shift, vague or ambiguous references, and agreement with antecedents) | L.1.3 Edit to correct errors in pronoun usage, including pronoun-antecedent agreement, unclear pronoun references, and pronoun case L.1.7 Edit to correct errors in subject-verb or pronoun antecedent agreement in more complicate situations (e.g., with compound subjects, interceding phrases, or collective nouns) | |
| Edit to eliminate errors in capitalization (including proper names and adjectives, titles, and months/seasons) | L.2.1 Edit to ensure correct use of capitalization (e.g., proper nouns, titles, and beginnings of sentences) | |
| Edit to eliminate errors in punctuation (including commas in a series, commas between independent clauses joined by a conjunction, introductory elements, appositives, and the overuse of commas) | L.2.4 Edit to ensure correct use of punctuation (e.g., commas in a series or in appositives and other non-essential elements, end marks, and appropriate punctuation for clause separation) | |
| Edit to eliminate errors in spelling (restricted to errors related to possessives, contractions and homophones) | L.1.1 Edit to correct errors involving frequently confused words and homonyms, including contractions (passed – past, two-too-to, their-they're- there, knew-new, it's-its) | |
| Not assessed | L.1.4 Edit to eliminate non-standard or informal usage (e.g., try to win the game instead of try and win the game) | |

Compiled from The GED Test: A Content Comparison; and Human Resources and Skills Development Canada: What are Essential Skills.

Resources

Alberta Education, (2006). *Programs of Study Knowledge and Employability ELA 10-4, 20-4, 30-4*. Retrieved on April 21, 2015 from http://education.alberta.ca/media/645821/ela10_06.pdf

Barlow, J. (Editor). (n.d.). Steck-Vaughn: *Complete Canadian GED Preparation*. Toronto, ON., Nelson Education.

GED Testing Service. (2012). *The GED Test: A Content Comparison*. Retrieved on April 21, 2015 from <http://www.gedtestingservice.com/uploads/files/2487f6e1ca5659684cbe1f8b16f564d0.pdf>

Human Resources and Skills Development Canada, *What are Essential Skills*, retrieved on April 21, 2015 from http://www.esdc.gc.ca/eng/jobs/les/docs/tools/what_are_es.pdf

Middleswart, *The 5 Paragraph (Burger) Essay*. retrieved on April 21, 2015 from http://mrmulloy.weebly.com/uploads/1/0/9/3/10937155/burger_essay.pdf

Slenders, C. (2014). *Paragraphs and Essay Writing: Approaches to Consider*. PowerPoint Slide Presentation with Notes.

Time: 15–20 hours

Module 3: Scientific inquiry

Purpose

To become scientifically literate, individuals must develop a thorough knowledge of science and its relationship to technologies and society. They must also develop the broad-based skills needed to identify and analyze problems; explore and test solutions; and seek, interpret and evaluate information.

(Alberta Education Science 14-24, 2014, p. 1)

Objectives

- Comprehending scientific presentations
- Investigating design (experimental and observational)
- Reasoning from data
- Evaluating conclusions with evidence
- Working with findings
- Expressing scientific information
- Understand and apply scientific theories
- Apply probability and statistics

| | | Science Content Topics | | |
|----------------|---------------------------------|---|---|--|
| | | Life Science (40%) | Physical Science (40%) | Earth and Space Science (20%) |
| Focusing Theme | Human Health and Living Systems | Human body and health. Organization of life (structure and function of life). Molecular basis for heredity. Evolution. | Chemical properties and reactions related to human systems. | Interactions between Earth's systems and living things. |
| | Energy and Related Systems | Relationships between life functions and energy intake. Energy flows in ecological networks (ecosystems). | Conservation, transformation, and flow of energy. Work, motion and forces. | Earth and its system components and interactions. Structure and organization of the cosmos. |

(The GED Test: A Content Comparison, 2012).

Background information

Activity 1

Understanding what individual learners already know and have mastered is key to managing tight time constraints. The entry tests in the *Steck-Vaughn Complete Canadian GED Preparation Manual* are generally quick and easy to use and serve this purpose well. As noted above, you and the learners each need a copy of this manual.

This pretest is given on the first day of class. It is given with tight time lines. Learners are told that the purpose of this activity is for the facilitator to be able to know what they are able to do, so that the program can be tailored for their instructional needs. This pretest comes from the *Steck-Vaughn Complete Canadian GED Preparation Manual*. After learners complete the assessment, the teacher marks it, and compiles the information into a table so that strengths and weaknesses can be identified for individuals, groups and classes.

Eschooltoday.com is an excellent reference internet resource for the Life Science unit.

Physics4Kids.com is an excellent internet resource for the Physical Sciences unit.

Activity 2

This is a relatively straightforward lesson that is usually taught over one 90-minute class period. It involves a lot of discussion, “what if” analysis, and drawing conclusions. This is usually the last lesson in the life science unit and has a nice transition into chemistry studies.

Activity 1

Pre-assessment: The springboard to effective programming

Goal (facilitator): To develop an understanding of what skills learners are bringing to class – a benchmark for individuals, groups and classes.

Goals (learner): To understand the types of skills, activities and formats that learners will be able to complete by the end of the course. To understand their own current level of skill in order to formulate an individual study program.

Materials

- *Steck-Vaughn Complete Canadian GED Preparation Manual* Science Entry Test (pages 33 to 40)
- *Steck-Vaughn Complete Canadian GED Preparation Manual* Science Entry Test Performance Analysis Charts (page 41)
- Pre-assessment Template (Alberta GED and Essential Skills Pre-assessment.xlsx)
- Pencils and erasers
- Stopwatch or timer

STEP-BY-STEP INSTRUCTIONS

1. Hand out *Steck-Vaughn Complete Canadian GED Preparation Manual Science Entry Test*. Tell learners that they will have 40 minutes to complete 25 questions which are a sampling of the types of information that they will need to learn and know for the GED exam.
2. Set timer for 40 minutes. Have learners complete the test. Do not assist them in any way. Collect all tests as they are completed. Do not score in front of learners. Do not go over the questions in the first class. Review this information with the learners when you hand back the test and the test performance analysis sheets in the next class.
3. Mark tests. Complete the test performance analysis sheets for each learner. Transfer that information to the Pre-assessment Template. Look for individual, group, and class strengths and weaknesses. Prioritize weak areas and then develop the instructional plan to address weak skill areas. Try to determine if weaknesses are due to reading issues or if they are due to lack of exposure or understanding of the material. Quite often the follow up discussion when reviewing the pretest gives the instructor an idea if the content weaknesses are due to poor reading skills or lack of exposure or understanding of the content. Instructional approaches can then be tailored more appropriately for the needs of learners in the class.

Activity 2

Carbon cycle and photosynthesis

Goals

- Understand how the carbon cycle operates and why it is important to all living systems
- Understand the process of photosynthesis and how it is interdependent with the carbon cycle
- Understand unifying concepts and processes
- Understand the interdependence of organisms
- Achieve a basic understanding of chemical reactions

Materials

- Handout 10: *What is the Carbon Cycle?*
<http://eschooltoday.com/ecosystems/the-carbon-cycle.html>
- Handout 11: *What is Photosynthesis?*
<http://www.eschooltoday.com/photosynthesis/what-is-photosynthesis.html>
- Handout 12: *Conditions for Photosynthesis*
<http://www.eschooltoday.com/photosynthesis/conditions-for-photosynthesis.html>
- Additional free resources from eSchooltoday.com

STEP-BY-STEP INSTRUCTIONS

1. Distribute Handout 10: *What is the Carbon Cycle?* Explain that while the cycle looks simple it is extremely vital for all living creatures. Discuss how carbon is found in all living matter.
2. Brainstorm how carbon is used in our everyday lives: in medicine; in our homes (wood products, plastics, paints and fuels); in transportation (oil and gas); in growing our food – photosynthesis.
3. Explain that carbon does not disappear; it is just recycled into other forms during the process.
4. Explain the process of photosynthesis and how plants absorb carbon and turn it into glucose – plant energy. Handouts 11 and 12 are very helpful reference materials to guide this discussion. Discuss the importance of photosynthesis to the survival of all living systems. Have learners compare how the carbon cycle and photosynthesis are dependent upon each other, and how the cycle and photosynthesis are alike and different.
5. Explain the scientific equation of the process of photosynthesis. This may be the first introduction to chemical equations that learners have seen. Draw out the chemical equation using structural formulas so that the change process may become more visible for learners. Discuss the fact that the carbon does not disappear, it is transformed into something else the plant can use. Discuss that after the plant cannot use the carbon any longer (when the plant dies), the carbon is then once again transformed through the process of decomposition/decay.

Outcomes/indicators

Outcomes for this module.

| GED 2002/GED 2014/Essential Skills Learner Outcomes Comparison | | |
|---|---|---|
| Science | | |
| Science Practices | | |
| GED 2002 | GED 2014 | Essential Skills |
| Understand unifying concepts and processes, including: Systems Order and organization Evidence Models and explanations Change, constancy and measurement Evolution equilibrium | SP.1. a Understand and explain textual scientific presentations SP. 1.b Determine the meaning of symbols, terms and phrases as they are used in scientific presentations SP.1.c Understand and explain a non-textual scientific presentation SP.7.a Understand and apply scientific models, theories and processes SP. 7 b Apply formulas from scientific theories | |
| Use science as inquiry, including: Identifying questions and concepts that guide scientific investigations Designing and conducting scientific investigations Using appropriate tools and techniques to gather data Thinking critically and logically about relationships between evidence and explanations Analyzing alternative explanations Communicating scientific arguments Understanding scientific inquiry | SP.2.a Identify possible sources of error and alter the design of an investigation to ameliorate that error SP.2.b Identify and refine hypotheses for scientific investigations SP. 2.c Identify the strength and weaknesses of one or more scientific investigation designs SP.2.d Design a scientific investigation SP.2.e Identify and interpret independent and dependent variables in scientific investigations SP.3.a Cite specific textual evidence to support a finding or a conclusion SP. 3.b Reason from data or evidence to a conclusion SP.3.c Make a prediction based upon data or evidence SP.3.d Use sampling techniques to answer scientific questions SP.4.a Evaluate whether a conclusion or theory is supported or challenged by particular data or evidence SP.5.a Reconcile multiple findings, conclusions or theories SP.6.a Express Scientific information or findings verbally SP.8.a Describe a data set statistically SP.8.b Use counting and permutations to solve scientific problems SP.8.c Determine the probability of events | |
| Understand the links between science and technology to: Identify, change or improve a piece of technology or technique Make decisions in regards to identifying and stating new problems or needs Designing, implementing, and evaluating a solution | Science and technology, and science in social and global perspectives, are not separately assessed on the 2014 test. These overall concepts are integrated into the other relevant areas on the 2014 test | Using computers and other forms of technology |

| Science Practices | | |
|---|--|---|
| GED 2002 | GED 2014 | Essential Skills |
| Use science in social and personal perspectives to make decisions about personal and social issues including: Personal and community health Population growth Natural resources Environmental quality Natural and human-induced hazards Science and technology in local, national and global challenges | Science and technology, and science in social and global perspectives, are not separately assessed on the 2014 test. These overall concepts are integrated into the other relevant areas on the 2014 test | Finding and evaluating information to make rational decisions or to organize work |
| Science Content Topics | | |
| Physical Science | | |
| GED 2002 | GED 2014 | Essential Skills |
| Structure of atoms Structure and properties of matter Chemical reactions Motion and forces Conservation of energy and increase in disorder Interactions of energy and matter | P.a Conservation, transformation and flow of energy P.b Work, motion and forces P.c Chemical properties and reactions related to living systems | |
| Life Science | | |
| GED 2002 | GED 2014 | Essential Skills |
| The cell Molecular basis of heredity Biological evolution Interdependence of organisms Matter Energy Organization in living systems | L.a Human body and health L.b Relationship between life functions and energy intake L.c Energy flows in ecological networks (ecosystems) L.d Organization of life (structure and function of life) L.e Molecular basis for heredity L.f Evolution | |
| Earth and Space Science | | |
| GED 2002 | GED 2014 | Essential Skills |
| Energy in the earth system Geochemical cycles Origin and evolution of the earth system Origin and evolution of the universe | ES.a Interactions between Earth's systems and living things ES.b Earth and its system components and interactions ES.c Structures and organization of the cosmos | |

Compiled from The GED Test: A Content Comparison; and Human Resources and Skills Development Canada: What are Essential Skills.

Resources

Alberta Education. (2014). *Program of Studies Science 14, 24*. Retrieved on April 21, 2015 from http://education.alberta.ca/media/13335911/pos_science_14_24.pdf

Andrew Reader Studios, Physics4Kids.com, (2015). Retrieved on April 21, 2013 from <http://www.physics4kids.com/>

Barlow, J. (Editor). (n.d.). *Steck-Vaughn: Complete Canadian GED Preparation*. Toronto, ON., Nelson Education.

Conditions for Photosynthesis. *eSchoolToday*. Retrieved on April 21, 2015 from <http://www.eschooltoday.com/photosynthesis/conditions-for-photosynthesis.html>

GED Testing Service. (2012). *The GED Test: A Content Comparison*. Retrieved on April 21, 2015 from <http://www.gedtestingservice.com/uploads/files/2487f6e1ca5659684cbe1f8b16f564d0.pdf>

Human Resources and Skills Development Canada, *What are Essential Skills*, retrieved on April 21, 2015 from http://www.esdc.gc.ca/eng/jobs/les/docs/tools/what_are_es.pdf

Nii Noi Creative Solutions, *eSchoolToday*. Retrieved on April 21, 2015 from <http://www.eschooltoday.com>

What is the Carbon Cycle? *eSchoolToday*. Retrieved on April 21, 2015 from <http://eschooltoday.com/ecosystems/the-carbon-cycle.html>

What is Photosynthesis? *eSchoolToday*. Retrieved on April 21, 2015 from <http://www.eschooltoday.com/photosynthesis/what-is-photosynthesis.html>

Time: 15–20 hours

Module 4: Social studies

Purpose

Social studies provides opportunities for individuals to develop the attitudes, skills and knowledge that will enable them to become engaged, active, informed and responsible citizens. Recognition and respect for individual and collective identity is essential in a pluralistic and democratic society. Social studies helps individuals develop their sense of self and community, encouraging them to affirm their place as citizens in an inclusive, democratic society. (Alberta Education Social Studies 10-4 20-4, 2007, p.3)

Objectives

- Draw conclusions and make inferences
- Determine central ideas, hypotheses and conclusions
- Analyze events and ideas
- Interpret meanings of symbols, words and phrases
- Analyze purpose and point of view
- Integrate content presented in different ways
- Evaluate reasoning and evidence
- Analyze relationships between texts
- Write analytic responses to source texts
- Read and interpret graphs, charts, and other data representation
- Measure the center of a statistical dataset

| Focusing Themes | Social Studies Topic Matrix | | | |
|--|---|---|--|--|
| | Civics and Government (50%) | Canadian History (20%) | Economics (15%) | Geography and the World (15%) |
| Development of modern liberties and democracy | Types of modern and historical governments Principles that have contributed to the development of Canada and its constitution Structure and design of the Canadian government Individual rights and civic responsibilities | Key historic documents First Nation's Peoples contribution to the building of a nation War of 1812 English and French tensions result in a unique Confederation schema Canada's roles in World War I and II The Great Depression and the movement to universal governmental programs The Charter of Rights and Freedoms | Key economic events that shaped Canada and its policies Relationship between political and economic freedoms | Development of classical civilizations |
| Dynamic responses in Societal systems | Political parties, campaigns, and elections Contemporary public policy | Political parties, campaigns and elections | Fundamental economic concepts Micro/Macro economics Consumer Economics Economic causes and impacts of wars Economic drivers of exploration and colonization Scientific and Industrial revolutions | Relationships between the environment and societal development Borders between peoples and nations Human migration |

Adapted from "The GED Test: A Content Comparison".

Note: The Canadian History content of this matrix is a "best guess" extrapolation based on the content of the US History content in the American version of the similar matrix. The Canadian History content of the matrix was not available at the time of researching and publishing this guide.

Background information

Activity 1

Understanding what individual learners already know and have mastered is key to managing tight time constraints. The entry tests in the *Steck-Vaughn Complete Canadian GED Preparation Manual* are generally quick and easy to use and serve this purpose well. As noted previously, you and the learners each need a copy of this manual.

This pretest is given on the first day of class. It is given with tight time lines. Learners are told that the purpose of this activity is for the facilitator to be able to know what they are able to do, so that the program can be tailored for their instructional needs. This pretest comes from the *Steck-Vaughn Complete Canadian GED Preparation Manual*. After learners complete the assessment, the facilitator marks it, and compiles the information into a table so that strengths and weaknesses can be identified for individuals, groups and classes. Try to determine if weaknesses are due to reading issues or if they are due to lack of exposure or understanding of the material. Quite often the follow-up discussion when reviewing the pretest gives the instructor an idea if the content weaknesses are due to poor reading skills or lack of exposure or understanding of the content. Instructional approaches can then be tailored more appropriately for the needs of learners in the class.

Activity 2

Visual literacy is a component that can fit into many subject areas. As a result it is often left to the other guy/gal to teach; or it is assumed that this is a skill that learners already possess. This is a dangerous assumption, especially for English Language Learners. English Language Learners are often intimidated by information presented in visual formats. Explicit teaching of this skill will quickly build confidence in the learners' abilities to use context to develop meaning. This activity is usually a one- or two-class lesson.

Activity 3

This activity is a recommendation of a resource that forms a complete unit for the Canadian Government/Civics unit. *Our Canadian Governments Grades 5-8*, (2011) published by S&S Learning Materials is a resource, complete with lesson plans, worksheets and reproducible information pages, which is targeted for middle school students learning about government in Canada. The majority of the focus is on federal government, but discussion and activities are also included that focus on provincial/territorial and municipal governments.

Activity 1

Pre-assessment: The springboard to effective programming

Goal (facilitator): To develop an understanding of what skills learners are bringing to class – a benchmark for individuals, groups and classes.

Goals (learner): To understand the types of skills, activities and formats that learners will be able to complete by the end of the course. To understand their own current level of skill in order to formulate an individual study program.

Materials

- *Steck-Vaughn Complete Canadian GED Preparation Manual* Social Studies Entry Test (pages 24 to 31)
- *Steck-Vaughn Complete Canadian GED Preparation Manual* Social Studies Entry Test Performance Analysis Charts (page 32)
- Pre-assessment Template (Alberta GED and Essential Skills Pre-assessment.xlsx)
- Pencils and erasers
- Stopwatch or timer

STEP-BY-STEP INSTRUCTIONS

1. Hand out *Steck-Vaughn Complete Canadian GED Preparation Manual* Social Studies Entry Test. Tell learners that they will have 35 minutes to complete 25 questions, which are a sampling of the types of information that they will need to learn and know for the GED exam.
2. Set timer for 35 minutes for Part 1. Have learners complete the test. Do not assist them in any way. Collect all tests as they are completed. Do not score in front of learners. Do not go over the questions in the first class. Review this information with the learners when you hand back the test and the test performance analysis sheets in the next class.
3. Mark tests. Complete the *Steck-Vaughn Complete Canadian GED Preparation Manual* test performance analysis sheets for each learner. Transfer that information to the Pre-assessment Template. Look for individual, group, and class strengths and weaknesses. Prioritize weak areas and then develop the instructional plan to address weak skill areas.

Activity 2

Visual literacy: The forgotten literacy

Goal: To read and interpret graphs, charts, and other data representation.

Materials

- Handout 13: *Reading Diagrams, Charts, Graphs and Tables*
<https://education.alberta.ca/apps/Readtolive/Tools/Reading%20Diagrams.pdf>
- Handout 14: *Charts and Graphs: Choosing the Right Format*
http://www.mindtools.com/pages/article/Charts_and_Diagrams.htm
- Handout 15: *Measuring Damage*
<http://teacher.scholastic.com/scholasticnews/magazines/superscience/pdfs/SS-0411-REPRO-2.pdf>
- Handout 16: *Building a Bar Graph*
<http://teacher.scholastic.com/scholasticnews/magazines/superscience/archivepdfs/SS-GRAPH-TORNADO.pdf>
- Handout 17: *Fire Drill*
http://teacher.scholastic.com/scholasticnews/magazines/superscience/archivepdfs/SS-GRAPH_FIREDRILL.pdf
- Handout 18: *Wind Watch*
http://teacher.scholastic.com/scholasticnews/magazines/superscience/archivepdfs/SS-CHART_WINDWATCH.pdf
- Handout 19: *Where Energy Comes From*
<http://teacher.scholastic.com/scholasticnews/magazines/superscience/archivepdfs/SS-GRAPH-ENERGY.pdf>
- Handout 20: *Choose Which Graph to Use*
<http://teacher.scholastic.com/scholasticnews/magazines/superscience/archivepdfs/SS-GRAPH-WHICHGRAPH.pdf>
- *Steck-Vaughn Compete Canadian GED Preparation Manual*

STEP-BY-STEP INSTRUCTIONS

1. Distribute either or both Handouts 13 and 14. Read the handouts and discuss where learners have seen each type of chart or graph. Discuss what type of information the graph, chart or table was trying to convey. Ask if learners have seen other types of charts. If so, where, and what information was being given? Discuss how we use charts and tables on a daily basis: cooking, cleaning, medications, economic reports.
2. Review the essential aspects of charts, graph and tables. These would include labels on the x and y axis, the title for the table, the intervals of the table, the key or legend.

3. Distribute Handouts 15 to 20. Have learners work in pairs to complete each handout. Listen for discussions regarding interpretation and estimation. These can become key discussion points for discussing how exact visual representations must be and under what circumstances the “exactness” becomes less critical (the larger the interval, the less exact the visual representation is). Common learner errors occur in understanding the intervals, and not following the key or legend.
4. Ask learners how this might apply to Social Studies. In *Steck-Vaughn Complete Canadian Preparation Manual* preview lessons 14 to 17 and the GED review of economics on pages 250 to 267 to see how graphs and charts are applied and used in the GED program.

Activity 3

Canadian government/civics unit study

Goals

Content

- Understand what a government is and why it is necessary
- Describe the structure and components of the three tiers of Canadian government
- Understand the rights and responsibilities of Canadian citizens
- Understand the purpose and process of an election
- Identify services provided by tiers of Canadian governments
- Describe the process of becoming a Canadian citizen
- Explain the significance of civic buildings, symbols, and ceremonies

Reasoning and critical thinking

- Make comparisons
- Develop opinions and personal interpretations
- Make inferences
- Development of research skills
- Recognize the validity of differing points of view
- Use graphs and diagrams

Language skills

- Comprehend information
- Summarize events and details
- Recognize vocabulary associated with Canadian governments

Adapted from *Our Canadian Governments – Grades 5-8*, 2011 published by S&S Learning Materials.

Materials

Instructor’s Book: *Our Canadian Governments Grades 5-8*, 2011, published by S&S Learning Materials

Background

The book *Our Canadian Governments Grades 5-8*, 2011 edition published by S&S Learning Materials is a complete unit study and covers the vast majority of outcomes for the GED Canadian Civics unit (ISBN: 9781550356618). It contains 22 lesson plans and 75 reproducible worksheets and information pages. Other than the title, there is little in this book that would suggest this unit is for Grades 5 to 8. There are no juvenile pictures. The language is easy and straightforward. It is written at about a Grade 5/6 level so reading tasks should not be beyond the reach of GED students. If the cover and the front page were removed, our adult learners would not know that this was meant as a middle school Social Studies resource.

Not all lessons need to be taught in order to meet the GED Canadian Civics Outcomes, but this resource is comprehensive enough to provide the background required for this civics unit. It is a flexible resource that allows an instructor to cover this unit topic by topic as is needed, rather than a linear progression of lessons. As this resource is a complete unit that provides lesson plans, no step-by-step instructions will follow in this module. The step-by-step instructions are easy to follow in the *Our Canadian Governments Grades 5-8*, 2011 edition.

The handouts in this resource are copyright free. It can be purchased at Staples, Chapters, and most teacher resource outlets at a cost between \$18 and \$25.

Outcomes/indicators

Outcomes for this module.

| GED 2002/GED 2014/Essential Skills Learner Outcomes Comparison | | |
|--|---|---|
| Social Studies Practices | | |
| GED 2002 | GED 2014 | Essential Skills |
| Understand the meaning and intent of text and/or visual material; restate information and summarize ideas | SSP.1.a Determine the details of what is explicitly stated in primary and secondary sources and make logical inferences or valid claims based on evidence SSP.4.a Determine the meaning of words and phrases as they are used in context, including vocabulary that describes historical, political, social, geographic and economic aspects of social studies | |
| Identify implications and make inferences | SSP.1.b Cite or identify specific evidence to support inferences or analyses of primary and secondary sources, attending to precise details of explanations or descriptions of a process, event or concept | |
| Use information and ideas in a situation different from that provided by the item stimulus | SSP.1.b Cite or identify specific evidence to support inferences or analyses of primary and secondary sources, attending to precise details of explanations or descriptions of a process, event or concept | |
| Apply the appropriate abstraction to a new problem without prompting or instruction | Not assessed on the 2014 test | |
| Break down information and understand the relationship between component ideas | SSP.2.a Determine the central ideas or information of a primary or secondary source document, corroborating or challenging conclusions with evidence SSP.2.b Describe people, places, environments, processes, and events and the connections between and among them | |
| Distinguish facts from opinions and hypotheses | SSP.7.a Distinguish among fact, opinion, and reasoned judgment in a primary or secondary source document SSP.7.b Distinguish between unsupported claims and informed hypotheses grounded in social studies evidence | |
| Distinguish conclusions from supporting statements | SSP.11.b. Identify specific pieces of evidence an author uses in support of claims or conclusions | |
| Recognize information that is designed to persuade an audience, recognize unstated assumptions, recognize fallacies in logic in arguments or conclusions | SSP.5.b Identify instances of bias or propagandizing | Finding and evaluating information to make rational decisions or to organize work |
| Identify cause and effect relationships and distinguish them from other sequential relationships | SSP.3.a Identify the chronological structure of a historical narrative and sequence steps in a process | |
| Recognize the point of view of a writer in a historical account | SSP.5.a Identify aspects of a historical document that reveal an author's point of view or purpose | |
| Recognize the historical context of the text, avoiding "present-mindedness" | SSP.5.c Analyze how a historical context shapes an author's point of view | |
| Identify comparisons and contrasts among points of view and interpretations of issues | SSP.8.a Compare treatments of the same social studies topic in various primary and secondary sources, noting discrepancies between and among the sources | |

| GED 2002 | GED 2014 | Essential Skills |
|--|---|------------------|
| Determine implications, effects, and the value of presenting visual data in different ways | SSP.6.a Integrate quantitative or technical analyses with qualitative analysis in print or digital text SSP.6.b Analyze information presented in a variety of maps, graphic organizers, tables, and charts; and in a variety of visual sources such as artifacts, photographs, political cartoons SSP.6.c Translate quantitative information expressed in words in a text into visual form; translate information expressed visually or mathematically into words | |
| Use criteria provided to make judgments about the validity or accuracy of information | SSP.5.d Evaluate the credibility of an author in historical and contemporary political discourse | |
| Identify generalizations, principles, or strategies and assess the appropriateness of information to substantiate conclusions, hypotheses, and generalizations (using such criteria as source, objectivity, technical correctness, and currency) | SSP.2.a Determine the central ideas or information of a primary or secondary source document, corroborating or challenging conclusions with evidence SSP.5.d Evaluate the credibility of an author in historical and contemporary political discourse | |
| Assess the accuracy of facts | SSP.3.a Identify the chronological structure of a historical narrative and sequence steps in a process SSP.5.d Evaluate the credibility of an author in historical and contemporary political discourse | |
| Compare and contrast differing accounts of the same event | SSP.5.d Evaluate the credibility of an author in historical and contemporary political discourse SSP.8.a Compare treatments of the same social studies topic in various primary and secondary sources, noting discrepancies between and among the sources | |
| Recognize the role that values, beliefs, and convictions play in decision making | SSP.5.a Identify aspects of a historical document that reveal an author's point of view or purpose SSP.5.b Identify instances of bias or propagandizing | |
| | SSP.8 Analyzing relationships between texts | |
| | SSP.9 Writing analytic responses to source texts | |
| | SSP.10 Reading and interpreting graphs, charts and other data representation | |
| Canadian History | | |
| GED 2002 | GED 2014 | Essential Skills |
| Understanding the European colonization of North America | Content not yet published | |
| Identify Key European and First Nation's figures involved in the colonization of North America | | |
| Understand the significance of the French Fur trade to development of the Canadian Identity, and the consequences to the First Nation's peoples involved with the fur trade. | | |
| Understand the tensions between the Americans, the First Nation's people, the British (The war of 1812); the British and the French Between 1800 and 1867 (the formation of the British North America Act) | | |
| Understand the significance of the Riel Rebellion and the building of the Railroad to settlement of the Western Canada | | |
| Understand the similarities and differences in the roles Canada played in World War I and World War II | | |

| GED 2002 | GED 2014 | Essential Skills |
|--|--|------------------|
| Understand the economic and social justice issues that developed from the Great Depression (i.e. universal health care and other governmental universal programs) | | |
| Be able to understand individual rights and freedoms as identified by the Canadian Charter of Rights and Freedoms | | |
| Geography and the world | | |
| GED 2002 | GED 2014 | Essential Skills |
| World in spatial terms Places and regions Physical systems Human systems Environment and society Uses of geography Beginnings – 1000 BC (Beginnings and Early civilizations) 1000 BC – 300 BC (Classical traditions, empires, religions) 300 BC – 1770 AD (Growing trade, hemispheric interactions, First global age) 1750 – 1914 (Age of revolution) 1900 – present (urbanization, World Wars, Global Depression, Advances in Science and Technology) New Democracies of Africa, Asia, South America, The Cold War, “Global Culture” | G.a Development of classical civilizations G.b Relationships between the environment and societal development G.c Borders between peoples and nations G.d Human Migration | |
| Civics and Government | | |
| GED 2002 | GED 2014 | Essential Skills |
| Civic life Politics and Government Foundations of the Canadian Political system Canadian Government Relationship of Canada and the United States to other nations The roles of citizens in Canadian democracy | CG.a Types of modern and historical governments CG. b Principles that have contributed to the development of Canada’s constitution CG.c. Structure and design of the Canadian Government CG.d individual rights and civic responsibilities CG.e Political parties, campaigns, and elections in Canada CG.f Contemporary public policy | |
| Economics | | |
| GED 2002 | GED 2014 | Essential Skills |
| Economic reasoning and choice Comparison of economic systems Business in a free enterprise system Production and consumers Financial institutions Government’s role in the economy, labour and the economy Global Markets and foreign trade | E.a Key economic events that have shaped Canadian government and policies E.b Relationship between political and economic freedoms E.c Fundamental economic concepts E.d Micro economics and Macro economics E.e Consumer economics E.f Economic causes and impacts of war E.g Economic drivers of exploration and colonization E.h Scientific and industrial revolutions | |

Compiled from The GED Test: A Content Comparison; and Human Resources and Skills Development Canada: What are Essential Skills.

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Module 5: A final note and other considerations

Module 1 to 4: Final activity

It is not uncommon to have students ask to do a practice test at the end of the instructional cycle. In fact, this is a very good indicator/predictor as to how well students are prepared to write the GED test. There are several good sites on the web for students to practice on their own time; however, it is recommended that the pre-assessment be given again to students on the second last class day. That way, the instructor can mark the assessments and judge what content needs to be covered on the last day of class. Also, the test performance analysis charts will direct students to areas for further study or one-on-one tutorial assistance if required. Going over the rewritten pre-assessment on the last day of class allows for a final class review, and also allows individual students to see the gains they have made by taking the class.

2002 GED and 2014 GED assessments

At the time of writing and researching this guide, the 2002 GED test was being used to assess Alberta GED students. The challenge of this guide was to provide information that would be useful long after Alberta transitions to the 2014 GED assessment in January 2017. The pre-assessments that form Activity 1 in each of the first four modules will likely remain relatively useful for identifying student areas of strength and weakness, but will be less useful for student independent study to rectify those areas once the new 2014 GED assessment is implemented in 2017. It is anticipated that the new GED preparation manuals will likely include updated pre-assessments for instructors to use. Instructors should make use of them in the same manner as the pre-assessments for the 2002 GED assessment.

The outcomes have changed significantly in breadth and depth in Math and Science. Not all of the revised Canadian Social Studies outcomes were published or made available online at the time of writing and researching for this guide, therefore the outcomes for Canadian History were extrapolated from the revised outcomes in the American History section of Social Studies. The outcomes for Language Arts have been updated and are more complex in nature than those for the 2002 assessment.

The new GED assessment will be a computer-based test. This will provide a challenge to those learners who come from cultural backgrounds that are opposed to using technology (i.e. conservative/traditional LGM, Amish and Hutterite), and those who have limited exposure to using word processors and other computer applications. The additional level of “computer literacy” that will be necessary for successful completion of the GED test may well prove to be as much of a barrier to some learners as is literacy, numeracy and visual literacy. This may mean that explicit instruction in computer literacy may be a required component to the GED instructional program.

As the new GED assessment is computer-based, it is anticipated that there could be fewer GED writing centers in Alberta than there currently is now. That will have a direct impact on students and GED programs in general. There are many restrictions and

processes that the current writing centers will have to go through, or have in place, in order to qualify as a writing center for the new GED assessment. Some institutions have not yet decided if they will make the necessary transitions to remain a GED writing center. It is advised that GED instructors communicate with their nearest GED writing center to see what that institution's plans are for the future of GED assessments.

Registering for the GED test (2002 and 2014 assessments)

Eligibility

In order to be eligible for writing the GED test students will need to be:

- 18 years of age or older
- Not enrolled in a school for ten consecutive months or longer
- Have an Alberta Student Number

Cost and writing centers

The cost for writing GED varies from writing center to writing center. Currently, a listing of writing centers can be found at <http://education.alberta.ca/students/hsed/centres/>

Please note that some of these writing centers may choose not to continue as a writing center for the new GED assessment in January 2017. Please contact the nearest writing center to determine if they will still be an option for writing for your students.

Student numbers

All students will need to have an Alberta Student Number to apply to write their GED test. Students that have resided or went to school in Alberta will have a student number. Students that have not resided in Alberta or went to school in Alberta can apply for a student number. This documentation should be completed as part of registering for the GED preparation class. This form can be found at: <http://education.alberta.ca/media/14524394/request-for-alberta-student-number.pdf>

Rewrites

Currently, the 2002 GED assessment allows a student to rewrite the tests that they did not successfully complete with a minimum score of 450 without having to rewrite the entire exam (five subjects). However, the 2014 GED assessment does not allow a student to rewrite only the portion they did not successfully complete. Students who wish to rewrite the 2014 GED assessment will have to rewrite the entire exam (all five subjects). Costs associated with rewriting the GED vary from writing center to writing center.

Appendix 1: Principles of adult learning and helping skills

Purpose

Facilitating adult learning programs starts with asking yourself:

- What do I know about adult learners?
- Do I have a good foundation in adult learning to guide my practice?

Without having a basic understanding of adult learning principles, building positive relationships may be challenging for reasons not known to you. Equally important to knowledge about adult learning is your understanding and use of a process that guides your communication with a learner. If you reflect on your own adult learning experiences you may find that what made your experience positive or negative is how grounded your learning experience was in adult learning principles and whether the process was an engaging one that moved you towards your goal.

In this section, you are introduced to a theoretical construct or model intended to provide the foundation to build your relationship with adult learners. First, you'll explore Malcolm Knowles' (1982) theory for the purposes of understanding adult learning in the context of the Community Adult Learning System. His theoretical principles are used extensively with adult literacy learners. Knowles' work is a helpful guide for essential aspects of your work with adult learners. These include:

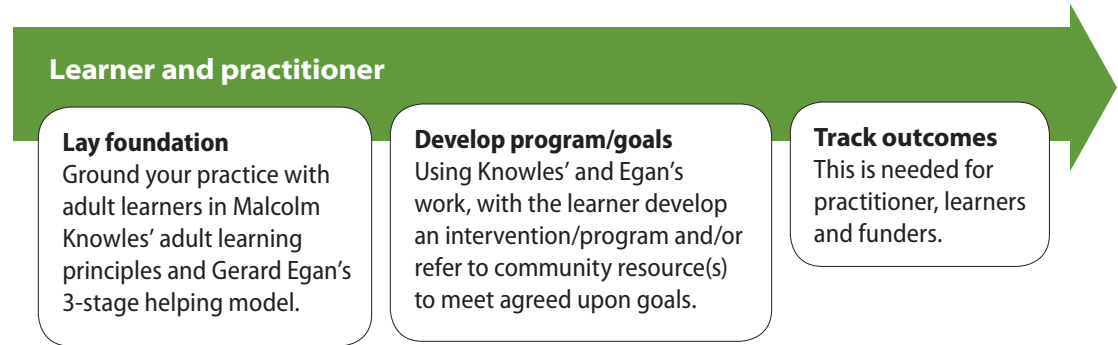
- Needs assessment
- Goal setting
- Action planning
- Development of an intervention/program
- Measurement of outcomes

For the purposes of this section, you will focus on adult learning principles only and not on adult learning styles. Learning styles elaborate the various ways learners learn, for example visual, auditory, kinesthetic and so on.

Second, an introduction to Gerard Egan's (1998) 3-stage model describes a simple process of "helping". A process provides a path with stopping off points for you the practitioner and your learner to explore important questions. Without a path, it is easy to get lost along the way in assisting your learner. From the starts and stops along the way, the learner and practitioner are continuously assessing the learner's progression and making adjustments as needed. Through consistent validation of the milestones accomplished, adult learners build the confidence and skills necessary to tackle further learning. For literacy learners, tackling further learning is one of the most important outcomes achieved.

The following schematic represents the process that lays the groundwork for the path shared by practitioner and learner.

Building a pathway with adult learners



Often one of your biggest challenges is bridging the gap between theory and the application of theory to real-life situations. For the purposes of working with literacy learners we'll explore the definition of learning first, followed by Knowles' theory. When discussing the definition of learning, an important aspect to remember is the depth to which skills and knowledge are processed. Generally this definition of learning includes the concepts of reflective and non-reflective learning.

Jarvis (1992) pointed out that learning may be reflective and non-reflective. Non-reflective learning is memorization or repetitive performance of a simple task. Reflective learning requires more thinking; it is when learners seek to understand the "why's" of something. The knowledge or skill can be broken down into parts and reassembled in a new form to be used differently. Learning in this respect moves along a continuum; at one end is non-reflective learning while reflective learning is at the other end. For example, simply memorizing how to add fractions would be leaning towards the non-reflective end of the continuum. If, however, you wanted to use this mathematical operation to measure and calculate various lengths of wood and fabric, or to measure ingredients for a recipe, you would be moving toward the reflective end of the continuum. You would be processing this skill at a deeper level in order to apply it across a variety of situations. If we accept that learning is best viewed as occurring along a continuum, then when facilitating learning or designing a learning opportunity the process also needs to be viewed as a continuum based on your learner's strengths, needs and goals.

Just as there is a continuum in learning there is a range in adult education approaches. In the last 50 plus years, adult education has swung from pedagogy, commonly understood as a "teacher-centered" approach to andragogy, understood as a "learner-centered" approach. Today, the approach rests somewhere in the middle.

The following table distinguishes nicely the differences between pedagogy and andragogy (Herod, 2002).

| Pedagogy (teacher-centered) | Andragogy (learner-centered) |
|---|---|
| Learners are dependent | Learners are independent and self-directed |
| Learners are externally motivated | Learners are intrinsically motivated (interested in learning) |
| Learning environment is formal and characterized by competitiveness and value judgments | The learning environment is more informal and characterized by equality, mutual respect and cooperation |
| Planning and assessment is conducted by the teacher | Planning and assessment is a collaborative affair between teacher and student |
| Teaching is characterized by transmittal techniques (lectures, assigned readings etc.) | Teaching is characterized by inquiry projects, experimentation, independent study |
| Evaluation is accomplished mainly by external methods (grades, tests and quizzes) | Evaluation is characterized by self-assessment |

As the table shows there is stark contrast between pedagogy and andragogy approaches. These terms are a bit of a mouthful so many adult educators use the terms “directed learning” when referring to pedagogy and “facilitated learning” when referencing andragogy. Knowles used the term andragogy to mean the “art and science of helping adults learn” and other adult educators too came to see the false distinction between andragogy and pedagogy. For example, some children do well with a “facilitated” approach and some adults do well with a “directed” approach. It is through this discovery that Knowles later on in his work recognized the middle of the continuum best represented his theory about adult learning.

Near the middle of the continuum, his assumptions about approaches to adult learning are best described as “problem-based and collaborative”. He did not subscribe to a didactic and lecturing approach nor to a completely self-directed one, both of which are represented on the extremes of the continuum. Further, he acknowledged at any given time a learner may shift position on the continuum due to factors such as the subject matter, learning objectives and learning style. Generally, the characteristics of directed and facilitated learning and that which falls in between, problem-based and collaborative, are captured in the snapshot below.

Characteristics of directed, problem-based/collaborative and facilitated learning

| Directed learning | Problem-based and collaborative | Facilitated learning |
|--|---|---|
| Characterized by lecturing, drills, memorization, question and answer, and immediate feedback. Teacher acts as “sage on the stage” for setting learning objectives and assessing skills/knowledge. | Characterized by guided discussions, group work, problem-based learning. Teacher and students negotiate learning objectives to some extent. Assessment is a collaborative effort between teacher and learner. | Characterized by independent projects, learner-directed discussions, critical thinking. Teacher acts as “guide on the side”. Learners set learning objectives with some guidance. |

This said, Knowles' (1984) research holds a set of assumptions about how adults learn. For adults to be engaged in learning he identified six principles. They are:

1. Adults are relevancy oriented
2. Adults are internally motivated and self-directed
3. Adults bring life experiences and knowledge to learning experiences
4. Adults are goal oriented
5. Adults are practical
6. Adult learners like to be respected

If you think back on your own positive and negative adult learning experiences, how many of the six adult learning principles were in place? Throughout your interactions with learners, being mindful of the six adult learning principles approaches to adult learning helps to stay focused more on the learner's needs and less on your own. Sometimes these principles may not always be evident with learners for a number of reasons – lack of confidence, fear, shame and so on. You as a practitioner, in building a relationship with your learner, must make every opportunity to recognize, use and applaud each of the six principles.

Developing a helping relationship with your learner

Armed with a deepening understanding of adult learning principles, let's return to mapping out how you would apply this to a learner interaction. The mapping usually involves three steps:

1. First, a learner comes to seek information; he/she may have been referred or comes on his own. Or, you may see a community need to offer literacy training to a group.
2. In both cases, either working one-on-one or with a group, you need to build a respectful, trusting, and caring relationship. Without these elements in a "helping" relationship, the outcomes may not reflect the desire.
3. Next, as a practitioner, how do you build this relationship to establish goals, processes and outcomes with your learner? For some, you may have years of experience and/or formal training that provides you with the skills and confidence. For others, intuitively you may have a sense of what needs doing but not a clear process of how to proceed. Still others may be completely new to the field and grappling with how to go forward. In any case, an introduction to a simple, effective framework may serve your needs.

Gerard Egan, author of *The Skilled Helper – A Problem Management Approach to Helping* (1998), developed a simple 3-stage model. This model guides helpers to build relationships that empower people to take responsibility for their own goals and develop opportunities. The person's own agenda is central, and the model seeks to move the person towards action leading to outcomes which they choose and value.

This model is a framework for conceptualising the helping process, and is best used in working on recent past and present issues. Helping takes place in a variety of settings – teaching, facilitating and counselling. Egan's model can be used in all these helping relationships and for this reason it was chosen for working with literacy learners. Furthermore, a model keeps us from thrashing around wondering where to go next; it provides a road map of sorts.

The Egan model aims to help the practitioner and learner address three main questions. They form the skeleton of Egan's model.

1. What is going on?
2. What do I want instead?
3. How might I get to what I want?

In each of the three stages, there are three overall aims prompted by questions. By using the questions and directives with the learner you will more easily be able to help the learner identify the issues and plan accordingly to work towards resolution.

- Stage 1 current scenario:
Gathering information will aid in getting a current picture of the learner's life and where the focus would be best placed.
- Stage 2 preferred scenario:
You are helping the learner determine what they want and need in their life. The aim is to establish realistic, manageable and measurable goals.
- Stage 3 action strategies:
The ultimate aim is to develop a realistic plan with specific actions to be taken complete with timelines.

Sometimes in your work, relationships come to an abrupt end with some of your learners and often there is little you can do about it. This said, stage models focussing on beginnings, middles and endings do help you to think about what might be involved at different times in the relationship and develop appropriate guidance.

Egan's 3-stage model

| Stage 1: Current scenario | Stage 2: Preferred scenario | Stage 3: Action strategies |
|---|--|--|
| <p>The Story What's going on?</p> <p>↓</p> <p>Blind spots What's really going on?</p> <p>↓</p> <p>Leverage Need to focus/prioritize.</p> | <p>Possibilities What do I want/need?</p> <p>↓</p> <p>Change Establish goal(s).</p> <p>↓</p> <p>Commitment Are goals right?</p> | <p>Possible actions How many ways are there?</p> <p>↓</p> <p>Best fit What will work for me?</p> <p>↓</p> <p>Plan What next and when?</p> |

Summary

Using Knowles' theory and Egan's 3-stage model with your learners accomplishes two things. First, Knowles' work reminds you to view adults not as empty vessels waiting to be filled but rather as full vessels with a mixture of experience, skills and beliefs. This experience, skills and beliefs is what propels all of us in meeting our learning goals. At a different point and time in adult's lives, we may require adding new skills and experiences to the mixture in order to meet new goals.

Second, Egan's 3-stage model provides a process to guide how you and the learner ferret out the needed additions to the mix. The aim here is to help create a learner's pathway that will take us as learners from where we are now to where we want to be.

Resources

Egan, K. (1998) *The Skilled Helper. A problem-management approach to helping*, Pacific Grove: Brooks/Cole.

Knowles, M. S. et al (1984) *Andragogy in Action. Applying modern principles of adult education*, San Francisco: Jossey Bass.

Appendix 2: Introduction to Essential Skills

Over the years, the definition of “literate” has expanded beyond one’s ability to simply read, write and spell. With the increasing popularity of technology, demands on individuals to deal with a plethora of information in their workplace and at home has dramatically increased. Today being literate refers to the ability to locate, understand, evaluate, use and convey information at home, work and in the community. According to the Government of Canada (2014), this broader definition of being literate is best understood by referring to Essential Skills.

Generally, Essential Skills are used by people to carry out a wide variety of everyday life and work tasks. They are not the technical skills required by particular occupations but rather the skills applied in all occupations. For example, writing skills are required in a broad range of activities. The complexity and frequency of writing varies, of course. Some people write simple grocery lists, while others write training manuals.

Further, Essential Skills are **enabling skills** that:

- Provide people with a foundation to learn other skills
- Enhance people’s ability to adapt to change

The following table lists, describes and provides examples of the nine Essential Skills.

The Nine Essential Skills

| Essential Skills | Typical applications | Workplace examples | Community examples |
|---|---|--|---|
| Reading Understanding materials written in sentences or paragraphs (e.g. letters, manuals). | Scan for information or overall meaning. Read to understand, learn, critique or evaluate. Analyze and synthesize information from multiple sources or from complex and lengthy notes. | An airline sales agent reads notices on a computer screen, such as special handling requirements or weather information. | You may use this skill to understand a lease agreement for a new apartment. |
| Document Use Finding, understanding or entering information (e.g. text, symbols, numbers) in various types of documents, such as tables or forms. | Read signs, labels or lists. Understand information on graphs or charts. Enter information in forms. Create or read schematic drawings. | A bricklayer interprets blueprints to determine the height, length, and thickness of walls. | You may use this skill when referring to a bus schedule to plan an outing. |
| Numeracy Using numbers and thinking in quantitative terms to complete tasks. | Make calculations. Take measurements. Perform scheduling, budgeting or accounting activities. Analyze data. Make estimations. | Payroll clerks monitor vacation entitlements to prepare budget and scheduling forecasts. | You may use this skill to complete an application for a credit card. |

| | | | |
|---|---|--|--|
| <p>Writing</p> <p>Communicating by arranging words, numbers and symbols on paper or a computer screen.</p> | <p>Write to organize or record information.</p> <p>Write to inform or persuade.</p> <p>Write to request information or justify a request.</p> <p>Write an analysis or a comparison.</p> | <p>Human resources professionals write recommendations on issues such as workplace health and safety.</p> | <p>You may use this skill to complete an application for a credit card.</p> |
| <p>Oral Communication</p> <p>Using speech to exchange thoughts and information.</p> | <p>Provide or obtain information.</p> <p>Greet, reassure or persuade people.</p> <p>Resolve conflicts.</p> <p>Lead discussions.</p> | <p>Office clerks take messages and share information by phone and in person.</p> | <p>You may use this skill to explain a food allergy to a server at a restaurant.</p> |
| <p>Working with Others</p> <p>Interacting with others to complete tasks.</p> | <p>Work independently, alongside others.</p> <p>Work jointly with a partner or helper.</p> <p>Work as a member of a team.</p> <p>Participate in supervisory or leadership activities.</p> | <p>Municipal engineers work with technicians, inspectors, and suppliers to complete</p> | <p>You may use this skill when working with volunteers to organize a fundraising activity.</p> |
| <p>Thinking</p> <p>Finding and evaluating information to make a rational decision or to organize work.</p> | <p>Identify and resolve problems.</p> <p>Make decisions.</p> <p>Find information.</p> <p>Plan and organize job tasks.</p> <p>Use critical thinking.</p> <p>Use memory.</p> | <p>Paramedics diagnose a patient's condition based on medical charts and their own observations. They use their judgment to start an appropriate treatment plan.</p> | <p>You may use this skill to research and select courses at your local adult learning centre.</p> |
| <p>Computer Use</p> <p>Using computers and other forms of technology.</p> | <p>Use different forms of technology, such as cash registers or fax machines.</p> <p>Use word processing software.</p> <p>Send and receive emails.</p> <p>Create and modify spreadsheets.</p> <p>Navigate the Internet.</p> | <p>Telephone operators use customized software to scan databases for telephone numbers or long distance calls.</p> | <p>You may use this skill when withdrawing or depositing money at an automatic teller machine (ATM).</p> |
| <p>Continuous Learning</p> <p>Participating in an ongoing process of improving skills and knowledge.</p> | <p>Learn on the job.</p> <p>Learn through formal training.</p> <p>Learn through self-study.</p> <p>Understand your own learning style.</p> <p>Know where to find learning resources.</p> | <p>Retail sales associates improve their skills and knowledge by attending sales training and reading product brochures.</p> | <p>You may use this skill when attending a first aid course at a community centre.</p> |

Essential Skills titles and descriptions serve as a common language between workers, employers, educators and service providers. Since Essential Skills use the language of the workplace, they serve as a way for educators to discuss skill gaps with employers and employees. In addition, because they describe functional tasks, Essential Skills can be used to describe what individuals do at home, at school and in the community. This common language is useful to individuals involved in skills upgrading and to the service providers supporting individuals as they work towards their next steps.

The common language of Essential Skills is based on international research. In 1995 research to understand the literacy levels of populations as a whole was carried out by the International Adult Literacy Survey (IALS). They sought to understand and compare literacy levels across countries. It focused on measuring the proficiency levels of processing information across three literacy domains: prose, document and quantitative. Prose literacy is described as the knowledge and skills needed to understand and use information from texts including editorials, news stories, poems and fiction. Document literacy is described as the knowledge and skills required to locate and use information contained in various formats, including job applications, payroll forms, schedules, tables and graphics. While quantitative literacy is the knowledge and skills required to apply arithmetic operations, either alone or sequentially, to numbers embedded in printed materials, such as balancing a chequebook, figuring out a tip, completing an order form or determining the amount of interest on a loan.

It was found that by simply categorizing commonly used skills into nine categories was not helpful enough for service providers to build training around acquisition of the skills. They needed to know whether the learner was a beginner or a more advanced user of the skill. This question led IALS to develop five broad literacy levels used to describe the level at which the learner was performing the task.

Descriptions of each of the five IALS literacy levels follows:

- **Level 1:** read relatively short text, locate and enter a piece of information into that text, and complete simple, one-step tasks such as counting, sorting dates or performing simple arithmetic.
- **Level 2:** the ability to sort through “distractors” plausible, but incorrect pieces of information, to integrate two or more pieces of information, to compare and contrast information and to interpret simple graphs.
- **Level 3:** demonstrate the ability to integrate information from dense or lengthy text, to integrate multiple pieces of information and to demonstrate an understanding of mathematical information in a range of different forms. Level 3 tasks typically involve a number of steps or processes in order to solve problems.
- **Level 4:** tasks involve multiple steps to find solutions to abstract problems. Tasks require the ability to integrate and synthesize multiple pieces of information from lengthy or complex passages, and to make inferences from the information.
- **Level 5:** requires the ability to search for information in dense text that has a number of distractors, to make high-level inferences or use specialized background knowledge and to understand complex representations of abstract formal and informal mathematical ideas.

Overall, it is generally accepted that individuals who can demonstrate competency with Level 3 tasks are able to manage the demands of daily life and of most entry-level jobs. For this reason, literacy programming tends to focus on skill development for tasks at Levels 1 and 2, with some upgrading reaching into Level 3. The key point here is that the level of literacy one needs depends on the context.

As a facilitator your goal is to:

- Help the learner assess which Essential Skills are needed to accomplish the task
- Assess the functioning literacy level of the learner
- Develop learning strategies that match the learner's level of literacy

To summarize, remember that Essential Skills are dormant until there is a task. Essential Skills are not tasks, they are used to complete a task. Furthermore, the literacy level of the learner needs consideration in order for the learning to be effective. For a more thorough discussion of Essentials Skills, review Unit 13 in *Creating Learning Partners* (2007).

Resources

Creating Learning Partners: A Facilitator's Guide for Training Effective Adult Literacy Tutors (2007). Calgary, Alberta. Literacy Alberta.

Kirsch, I. (2001). *The International Adult Literacy Survey (IALS): Understanding What Was Measured*. Educational Testing Service (ETS).

Ontario skills passport. (2010). Ottawa, Ontario: Government of Ontario. Queen's Printer of Ontario.

Alberta GED and Essential Skills **Handouts**

Integers: Operations with Signed Numbers

*Before you do ANY computation, determine the OPERATION!
Then follow the instructions for THAT operation.*

[Addition](#) [Subtraction](#) [Multiplication or Division](#) [Practice Exercises](#)

ADDITION

Do the numbers have the **SAME SIGN**?

YES - Same Signs:

Find the **SUM**:

$$(-3) + (-6) = (-9)$$

$$(+4) + (+5) = (+9)$$

NO - Different signs:

Find the **DIFFERENCE**:

$$(+5) + (-7) = (-2)$$

$$(-4) + (+6) = (+2)$$

Either way: Keep the sign of the **LARGER*** number.

* "LARGER" is used here as a quick (but mathematically imprecise) way to describe the integer with the greater **Absolute Value** (ie. distance from zero). In each of the examples above, the **SECOND integer** has a greater **Absolute Value**.

SUBTRACTION

First, change the SUBTRACTION problem to an ADDITION problem;

Then, follow the rules (above) for solving the new ADDITION problem.

$$(-6) - (+2) =$$

First, copy the problem *exactly*. $(-6) - (+2) =$

1. The first number stays the same. (-6)

2. Change the operation. $(-6) +$

3. Switch the **NEXT SIGN**. $(-6) + (-2)$

4. Follow the rules for addition. $(-6) + (-2) = (-8)$

Subtract means:
Add the **opposite**. $(+2) - (-6) =$
 $(+2) + (+6) = (+8)$

Subtract means:
Add the **opposite**. $(-7) - (-3) =$
 $(-7) + (+3) = (-4)$

Subtract means:
Add the **opposite**. $(+4) - (+9) =$
 $(+4) + (-9) = (-5)$

MULTIPLICATION OR DIVISION

First, **DO** the multiplication or division.

Then determine the sign:

Count the number of **negative** signs....

Are there an *EVEN* number of *negative* signs?

YES (an *EVEN* number of *negative* signs) the answer is **POSITIVE**

NO (an *ODD* number of *negative* signs) the answer is **NEGATIVE**

First, copy the problem *exactly*. $(-2) * (-4) * (-6) =$

DO the multiplication or division. $|2| * |4| * |6| = |48|$

Count the number of **negative** signs.... $(-2) * (-4) * (-6) =$

Determine the sign of the answer:

Are there an **EVEN** number of negatives?

If **YES**, the answer is **POSITIVE**

otherwise, the answer is **negative**.

A total of **THREE NEGATIVES**
Three is **NOT EVEN** (it's odd).
So the answer is **NEGATIVE**

-48

$$(4) \div (2) * (6) = 12$$

A total of **ZERO NEGATIVES**
Zero **IS EVEN**.
So the answer is **POSITIVE**

$$(4) \div (-2) * (6) = -12$$

A total of **ONE NEGATIVE**
One is **NOT EVEN** (it's odd).
So the answer is **NEGATIVE**

$$(-4) \div (2) * (-6) = 12$$

A total of **TWO NEGATIVES**
TWO IS EVEN.
So the answer is **POSITIVE**

Rule 1: Division by Zero in a Simple Fraction

The denominator of any fraction cannot have the value zero. If the denominator of a fraction is zero, the expression is not a legal fraction because its overall value is undefined

Rule 2: Zero in the Numerator of a Simple Fractions

A numerator is allowed to take on the value of zero in a fraction. Any legal fraction (denominator not equal to zero) with a numerator equal to zero has an overall value of zero.

Rule 3: One Minus Sign in Simple Fractions

If there is one minus sign in a simple fraction, the value of the fraction will be negative.

Rule 4: More Than One Minus Sign in a Simple Fractions

If there is an even number of minus signs in a fraction, the value of the fraction is positive.

If there is an odd number of minus signs in a simple fraction, the value of the fraction is negative.

Rule 5: The Division Symbol in a Simple Fractions

The Division Symbol - in a simple fraction tells the reader that the entire expression above the division symbol is the numerator and must be treated as if it were one number, and the entire expression below the division symbol is the denominator and must be treated as if it were one number.

Rule 6: Properties of the Number 1

Multiplying any number by 1 does not change the value of the number. Dividing any number by 1 does not change the value of the number..

Rule 7: Different Faces of the Number 1

The number 1 can take on many forms. $4 - 3 = 1$ and $10 - 9 = 1$ can be used as a substitution for the number 1 because they have a value of 1. When the numerator of a fraction is equivalent to the denominator of a fraction, the value of the fraction is 1. This only works when you have a legal fraction; i.e., the denominator does not equal zero. You can substitute one of these fractions for the number 1.

Rule 8: Any Integer Can Be Written as a Fraction

You can express an integer as a fraction by simply dividing by 1, or you can express any integer as a fraction by simply choosing a numerator and denominator so that the overall value is equal to the integer.

Rule 9: Factoring Integers

To factor an integer, simply break the integer down into a group of numbers whose product equals the original number. Factors are separated by multiplication signs. Note that the number 1 is the factor of every number. All factors of a number can be divided evenly into that number.

Rule 10: Reducing Fractions

To reduce a simple fraction, follow the following three steps:

1. Factor the numerator.
2. Factor the denominator.
3. Find the fraction mix that equals 1.

Rule 11: Multiplying Simple Fractions

To multiply two simple fractions, complete the following steps.

1. Multiply the numerators.
2. Multiply the denominators.
3. Reduce the results. (See Rule 10)
 - a. Factor the product of the numerators.
 - b. Factor the product of the denominators.
 - c. Look for the fractions that have a value of 1.

Rule 12: MULTIPLICATION

To multiply a whole number and a fraction, complete the following steps.

1. Convert the whole number to a fraction. (See [Rule 8](#))
2. Multiply the numerators.
3. Multiply the denominators.
4. Reduce the results. (See [Rule 10](#))
 - a. Factor the product of the numerators.
 - b. Factor the product of the denominators.
 - c. Look for the fractions that have a value of 1.

Rule 13: MULTIPLICATION

To multiply three or more simple fractions, complete the following three steps.

1. Multiply the numerators.
2. Multiply the denominators.
3. Reduce the results. (See Rule 10)
 - a. Factor the product of the numerators.
 - b. Factor the product of the denominators.
 - c. Look for the fractions that have a value of 1.

Rule 14: Dividing Simple Fractions

To divide one fraction by a second fraction, convert the problem to multiplication and multiply the two fractions.

1. Change the \div sign to \times and invert the fraction to the right of the sign.
2. Multiply the numerators.
3. Multiply the denominators.
4. Reduce the results. (See Rule 10)
 - a. Factor the product of the numerators.
 - b. Factor the product of the denominators.
 - c. Look for the fractions that have a value of 1.

Rule 15: DIVISION

To divide a fraction by a whole number, or a whole number by a fraction, convert the division process to a multiplication process, and complete the following steps.

1. Convert the whole number to a fraction
2. Change the \div sign to \times and invert the fraction to the right of the sign.
3. Multiply the numerators.
4. Multiply the denominators.

5. Reduce the results. (See Rule 10)
 - a. Factor the product of the numerators.
 - b. Factor the product of the denominators.
 - c. Look for the fractions that have a value of 1.

Rule 16: DIVISION

To divide three or more fractions, complete the following three steps.

1. Change the \div signs to \times sign and invert the fractions to the right of the signs.
2. Multiply the numerators.
3. Multiply the denominators.
4. Reduce the results. (See Rule 10)
 - a. Factor the product of the numerators.
 - b. Factor the product of the denominators.
 - c. Look for the fractions that have a value of 1.

Rule 17: BUILDING FRACTIONS

To build a fraction is the reverse of reducing the fraction. Instead of searching for the 1 in a fraction so that you can reduce, you insert a 1 and build.

Rule 18: ADDITION

To add fractions, the denominators must be equal. Complete the following steps to add two fractions.

1. Build each fraction so that both denominators are equal.
2. Add the numerators of the fractions.
3. The denominators will be the denominator of the built-up fractions.
4. Reduce the answer.

Rule 19: SUBTRACTION

To subtract, the denominators must be equal. You essentially following the same steps as in addition.

1. Build each fraction so that both denominators are equal.
2. Combine the numerators according to the operation of subtraction or additions.
3. The denominators will be the denominator of the built-up fractions.
4. Reduce the answer.

Rule 20: Order of Operations

Multiplication and division must be completed before addition and subtraction.

Rule 21: Order of Operations

Expressions in parenthesis are treated as one number and must be calculate first.

Rule 22: Order of Operations

If parentheses are enclosed in other parentheses, work from the inside out.

Rule 23: Order of Operations

The parenthesis instruct you to simplify the expression within the parenthesis before you proceed. The division symbol has the same role as the parenthesis. It instructs you to treat the quantity above the numerator as if it were enclosed in a parenthesis, and to treat the quantity below the numerator as if it were enclosed in yet another parenthesis

Rule 24: Complex Fractions

To manipulate complex fractions, just convert them to simple fractions and follow rules 1 through 23 for simple fractions

Rule 25: Complex Fractions

To multiply two complex fractions, convert the fractions to simple fractions and follow the steps you use to multiply two simple fractions.

Rule 26: Complex Fractions

To multiply add or subtract two complex fractions, convert the fractions to simple fractions and follow the steps you use to add or subtract two simple fractions

Rule 27: Compound Fractions

A compound fraction is sometimes called a mixed number. Recall that $3\frac{1}{2}$, $4\frac{1}{5}$, $-8\frac{2}{3}$ and $-8\frac{2}{3}$ are examples of compound fractions.

Rule 28: Converting Decimals to Fractions

For this review, we will focus on terminating fractions. Divide the fraction by 1, and then multiply the result by 1 in a form that will remove the decimal.

Rule 29: Converting Percentages to Fractions

Recall that $1\% = \frac{1}{100} = 0.01$. To convert a percentage to a fraction, simply convert 1% to $\frac{1}{100}$. To convert a percentage to a decimal, simply convert 1% to .01.

Rules of Exponents

By **Mary Jane Sterling**

Part of the **Algebra Workbook For Dummies Cheat Sheet**

Exponents are shorthand for repeated multiplication. The rules for performing operations involving exponents allow you to change multiplication and division expressions with the same base to something simpler. Remember that in x^a the x is the base and the “ a ” is the exponent.

Assume that neither x nor y are equal to zero:

Assume $x \neq 0$:

$$x^a x^b = x^{a+b}$$

$$\frac{x^a}{x^b} = x^{a-b}$$

$$(x^a)^b = x^{ab}$$

$$\sqrt[b]{x^a} = x^{a/b}$$

$$x^0 = 1$$

$$\frac{1}{x} = x^{-1}$$

$$\frac{1}{x^a} = x^{-a}$$

How to Multiply Exponents

You can multiply many exponential expressions together without having to change their form into the big or small numbers they represent. When multiplying exponents, the only requirement is that the bases of the exponential expressions have to be the same. So, you can multiply

$$2^4 \times 2^6, a^6 \times a^8, \text{ but you can't multiply } 3^5 \times 4^5$$

because the bases are not the same (although the exponents are).

To multiply powers of the same base, add the exponents together:

$$x^a \times x^b = x^{a+b}$$

So,

$$2^4 \times 2^9 = 2^{4+9} = 2^{13}$$

If there's more than one base in an expression with powers, you can combine the numbers with the same bases, find the values, and then write them all together. For example,

$$3^2 \times 2^2 \times 3^3 \times 2^4 = 3^{2+3} \times 2^{2+4} = 3^5 \times 2^6$$

Here's an example with a number that has no exponent showing:

$$4x^6 y^5 x^4 y^1 = 4x^{6+4} y^{5+1} = 4x^{10} y^6$$

When there's no exponent showing, such as with y , you assume that the exponent is 1, so in the above example, you write

$$y^1$$

How to Divide Exponents

You can divide exponential expressions, leaving the answers as exponential expressions, as long as the bases are the same. To divide exponents (or powers) with the same base, subtract the exponents. Division is the opposite of multiplication, so it makes sense that because you add exponents when multiplying numbers with the same base, you subtract the exponents when dividing numbers with the same base.

For example,

$$2^{10} \div 2^4 = 2^{10-4} = 2^6$$

Pretty easy, huh? Now wrap your brain around this:

$$\frac{4x^6 y^3 z^2}{2x^4 y^3 z} = 2x^{6-4} y^{3-3} z^{2-1} = 2x^2 y^0 z^1 = 2x^2 z$$

Any number to the power of zero equals 1, as long as the base number is not 0.

How to Add and Subtract with Powers

To add or subtract with powers, both the variables and the exponents of the variables must be the same. You perform the required operations on the coefficients, leaving the variable and exponent as they are. When adding or subtracting with powers, the terms that combine always have exactly the same variables with exactly the same powers.

Example 1:

$$x + x + x = 3x$$

Because the variables are the same (x) and the powers are the same (there are no exponents, so the exponents must be 1), you can add the variables.

Example 2:

$$x^2 - 2x^2 + 3x^2 + 3x^2 = 5x^2$$

Because the variables are the same (x) and the powers are the same (2), you can perform the required operations on the variables.

Example 3:

$$4x^4 - 3x^3 + 2x^2 + x - 1$$

Although the variables are the same (x), the powers are not the same (1, 2, 3, and 4). You can't simplify these terms because only the variables are the same, and both the variables and the powers need to be the same.

Example 4:

$$2x + 3x^2 + 5x^3 - 2x^2 - 3x - 1$$

$$5x^3 + (3x^2 - 2x^2) + (2x - 3x) - 1$$

$$5x^3 + (3 - 2)x^2 + (2 - 3)x - 1$$

$$5x^3 + x^2 - x - 1$$

Sometimes not all of the variables and powers will be the same — you may encounter a problem that has several groups of variables and powers that are not the same. In this case, you only add or subtract terms whose variables and powers are the same. (Notice that the exponents are listed in order from highest to lowest. This is a common practice to make answers easy to compare.)



The Order of Operations

In algebra, there exists the following fundamental operators: **Parentheses, Exponents, Division and Multiplication, Addition and Subtraction**. Many algebraic expressions or equations you come across use more than one operator and their solutions will be different depending on the order you carry out the different operations. Keep in mind that all expressions or equations are evaluated from left to right.

For example, given the expression:

$$36 - 4 \times 6$$

One possible solution could be $36 - 4 \times 6 = 192$, if we choose to evaluate the expression as follows:

$$36 - 4 = 32$$

then

$$32 \times 6 = 192$$

Alternatively, one can also evaluate the expression as follows:

$$4 \times 6 = 24$$

$$36 - 24 = 12$$

Out of two possible solutions, only the second is correct.

In algebra, any given expression or equation with more than one operator is evaluated using a standard notation referred to as the order of operations which is represented by the acronym PEMDAS.

PEMDAS

One easy way to remember the order of operations is to use the acronym **PEMDAS**. Observe that **PEMDAS** is formed using the first letter of each of the above operators. (**P**arentheses, **E**xponents, **M**ultiplication and **D**ivision, **A**ddition and **S**ubtraction).

Order of Operations is a standard used to denote which operators have precedence over the others and thus are solved first in any equation or expression.

Examples of the Order of Operations

Example 1

Evaluate the following

$$10 - 5 \times 2^2 + (36 \div 6) - 3$$

Step 1

First, evaluate whatever is in the parentheses:

$$10 - 5 \times 2^2 + (6) - 3$$

Step 2

Next, evaluate the exponent:

$$10 - 5 \times 4 + 6 - 3$$

Step 3

Evaluate any multiplication and division from left to right:

$$10 - 20 + 6 - 3$$

Step 4

Evaluate any addition and subtraction from left to right or which ever way makes it easier for you:

$$10 - 14 - 3$$

note that

$$10 - 20 + 6 - 3$$

is evaluated as

$$\begin{aligned} 10 + (-20 + 6) - 3 \\ = -7 \end{aligned}$$

Example 2

Solve for x in the equation below

$$21x = -5 + 3^{(9-2 \times 4 \div 2)}$$

Step 1

As always evaluate the expression within the parentheses first, since there is more than one operator in the parentheses, apply PEMDAS to the expression

$$21x = -5 + 3^{(9-8 \div 2)}$$

$$21x = -5 + 3^{(9-4)}$$

$$21x = -5 + 3^5$$

$$21x = -5 + 243$$

$$21x = 238$$

Step 2

Divide both sides by 21

$$\frac{21x}{21} = \frac{238}{21}$$

Step 3

$$x = 11.33$$

Example 3

Evaluate the following

$$6 \times (4 + 3^4) \div 5$$

Step 1

$$6 \times (4 + 81) \div 5$$

$$6 \times 85 \div 5$$

note that in the above expression, one can choose to divide first since that makes the computation easier

Step 2

$$6 \times 17 = 102$$

Example 4

Solve for x in the equation below

$$(10 \times 4) + (9 \times 3) - 8 + 44 \div 11 - 2 = x$$

Step 1

$$40 + 27 - 8 + 44 \div 11 - 2$$

Step 2

$$40 + 27 - 8 + 4 - 2$$

Step 3

$$67 - 4 - 2$$

Step 3

$$= 61$$

Quiz on the Order of Operations

1. Evaluate the following

$$6(5 + 2(3 - 8) - 3)$$

2. Evaluate the following

$$(3 - 5)^3 + \left(\frac{18}{6}\right)^2$$

3. Evaluate the following

$$\frac{(3^2 + 6)}{\frac{-24}{8}}$$

The 5 Paragraph (Burger) Essay

Mr. Middleswart - - English 10/10B

There are certain things that, as you go through school, you **NEED** to know how to do. In math, for example, it might be Pythagorean's theorem or the multiplication tables. In English, one thing that is **crucial** that you be able to understand is the 5 paragraph essay. If you plan on going through college, essentially every essay you'll write - and there will be a LOT of them - follows the 5 paragraph format. Even if you don't plan on going to college, to get through high school you'll need to know how to write one, and in the world outside, nearly all work-related papers (letters, business reports, cover letters, etc.) also follow the 5 paragraph format.

Now, many of you may be saying "Oh yeah - I know how to write an essay. No problem." It is true that many of you are good writers and can pull off a solid essay. However, very few of you have mastered the 5 paragraph essay format, and even those who have can use some extra practice. So, pay attention to the "Triple Whopper" format below - we'll use it often this semester, and you'll use it frequently in the future as well.

"The Top Bun" - Paragraph 1 - Introduction.

In this paragraph, the format (in order) is:

- Hook - how can you draw your reader in?
- Transition - how to get to your main info?
- Preview main points
- Thesis - what is the main point of your paper? That is, what is the answer to the question your paper explores?

"The Meat - Burger 1" - Paragraph 2 - First Supporting Idea

- Transition/topic sentence - What is your first main piece of information?
- Support the main piece of info with details - shoot for at least 3 supporting details
- Conclude the paragraph with a clincher

"The Meat - Burger 2" - Paragraph 3 - Second Supporting Idea

- Transition/topic sentence - What is your second main piece of information?
- Support the main piece of info with details - shoot for at least 3 supporting details
- Conclude the paragraph with a clincher

"The Meat - Burger 3" - Paragraph 4 - Last Supporting Idea

- Transition/topic sentence - What is your last main piece of information?
- Support the main piece of info with details - shoot for at least 3 supporting details
- Conclude the paragraph with a clincher

"The Bottom Bun" - Paragraph 5 - Conclusion

- Transition - General statement about your main point
- Briefly restate - in a sentence or two - your 3 big supporting ideas
- Restate or reword your thesis statement from your intro
- End the paragraph with a statement about what everything you wrote means



The 5 Paragraph Essay

Some Additional Important Information

As I said, if you can master the essay format on the back of this sheet, you'll be in good shape no matter what you are asked to write about. With that said, there are some more "rules" of writing a good essay - there are 5 that we will focus on.

1) Everything in your essay should relate back to, or support, your thesis.

- Your thesis is the main point of your entire paper. Everything you write - every sentence - should relate to it. This is especially true of topic statements at the beginning of each paragraph.

2) Do not use "I" statements in your paper.

- Saying "I think," "I feel," "I believe," etc. in your paper makes it weaker. Instead, simply take the "I" statements out and your writing will become much stronger. For example - writing "I think the Boston Red Sox are the best baseball team in the major leagues" is a fairly weak statement. Instead, leaving the "I" out changes the sentence to this: "The Boston Red Sox are the best baseball team in the major leagues." See how much stronger that sounds?

3) Always be sure you can back up and explain your supporting reasons.

- A very common problem in writing is that people put down a great supporting reason, and then leave it alone. Always ask yourself "why?" after you use a supporting reason, and then answer that question in your writing. Example - "Teens should be allowed to drive at 15." If left as is, this isn't a strong statement. Asking why this is true, and then answering it right after the statement, is the stuff good essays are made of. Also, make sure that when you explain those reasons, you use more than just your own thoughts - writing "Having to wait until you're 17 to drive is stupid" is a weak argument - give some reasoning - facts, other's thoughts, etc. - to make it stronger.

4) Try to be as formal as possible.

- An essay should have voice - that is, it shouldn't be so formally written that it is boring - but try to keep informal, casual writing out of essays. This means no AIM writing (LOL, JK!, etc.), no swearing, no slang ("You know what I mean?, etc...). Basically, pretend you're on a job interview when you're writing it. If you wouldn't say it to a potential boss, you probably shouldn't write it in your paper.

5) Do not add anything new to your conclusion.

- Your conclusion should sum up your paper, reminding the reader what you said. If you add any new writing/info to your conclusion, it only confuses the paper and the reader. So, just sum things up - do not add any new info.

Paragraph and Essay Writing



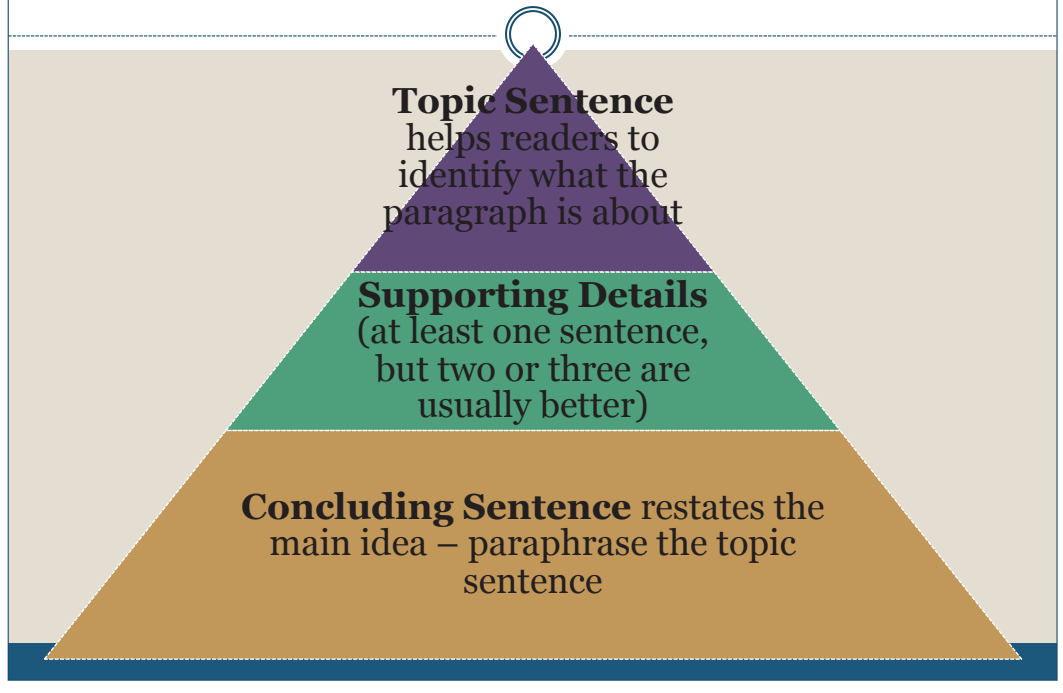
APPROACHES TO CONSIDER:

The Basic Pattern

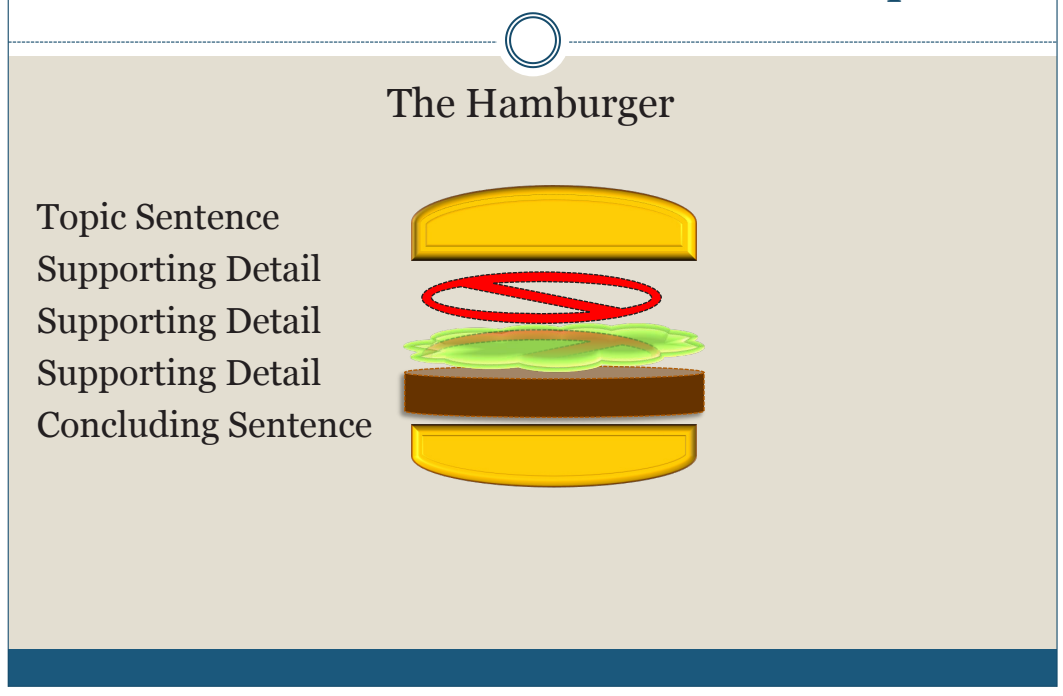


- Writing paragraphs and essays can be frustrating if you do not know where to start.
- There are many graphic organizers that can help you.
- There is no one “right” way, but there is a common format that you can use to get started.

Basic Pattern – The Ancient Pyramid



The Same Pattern, But Another Metaphor



Topic Sentence



The topic sentence determines the content of the paragraph.

The topic sentence must guide readers and capture their attention at the same time.

Most paragraphs have their topic sentence as the first sentence, *HOWEVER*, this is not always the case.

Explore your own writing style to see what works for you

Supporting Details



Supporting detail sentences are not any less important than topic sentences. They just play a different role.

Sentences containing supporting details may contain observations, comments or insights that are relevant to the main idea.

They are the “meat and potatoes,” or, “get down to business” part of the paragraph.

Concluding Sentence



The concluding sentence reinforces the whole paragraph.

It does not leave the reader wondering what the paragraph was about. Your readers know for certain what the “flavour” of the paragraph is.

Quite often the concluding sentence in the introductory paragraph in many reports contains an explicit thesis statement.

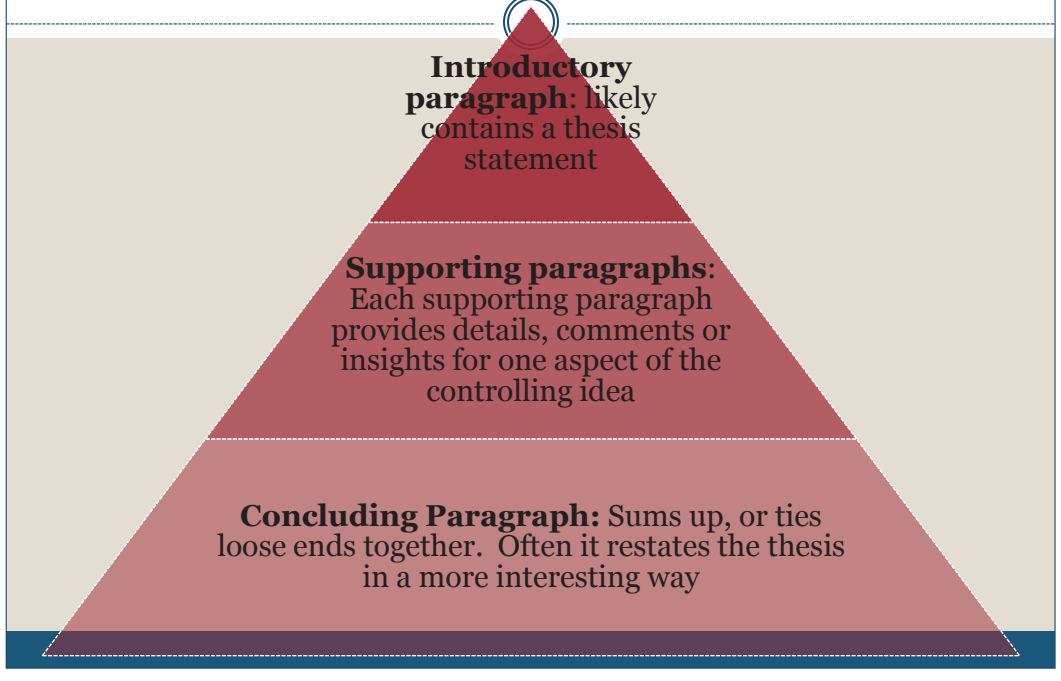
Essays – An Extension of the Same Metaphors



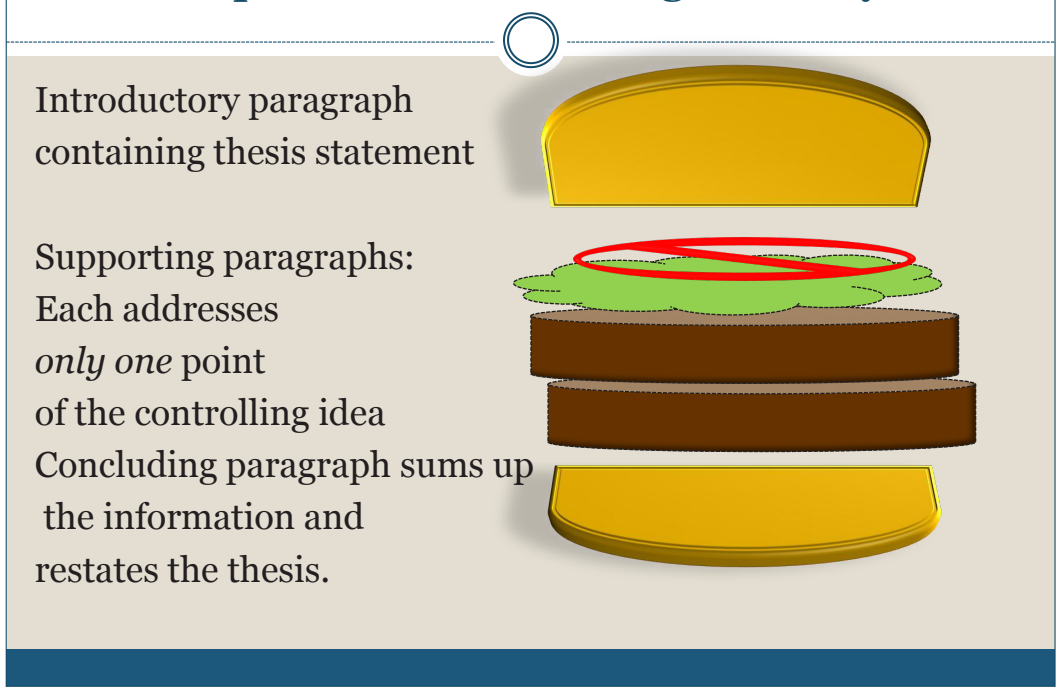
The same basic metaphors of the pyramid and hamburger can be applied to writing essays.

Essays usually contain an introductory paragraph, at least two or three (minimum) supporting paragraphs, and a concluding paragraph.

Essays and the Pyramid



“Super-Sized” Hamburger (Essay)



Thesis Statements



The thesis statement or main claim must be **debatable**

An argumentative or persuasive piece of writing must begin with a debatable thesis or claim. In other words, the thesis must be something that people could reasonably have **differing opinions** on. If your thesis is something that is generally agreed upon or accepted as fact then there is no reason to try to **persuade** people (OWL, 2013).

Thesis Statements



Example of a non-debatable thesis statement:

- Pollution is bad for the environment

Example of a debatable thesis statement:

- At least 25 percent of the federal budget should be spent on limiting pollution. (Owl, 2013)

Discussion point!

What makes the second statement debatable while the first is not?

Thesis Statements



The thesis needs to be **narrow (in focus)**

Generally the narrower the thesis the more effective your argument will be. Your thesis or claim must be supported by evidence. The broader your claim is, the more evidence you will need to convince readers that your position is right (Owl, 2013).

Thesis Statements



Example of a thesis that is too broad:

- Drug use is detrimental to society.

Example of a narrow or focused thesis:

- Illegal drug use is detrimental because it encourages gang violence. (Owl, 2013)

Discussion point!

What makes the second statement more focused than the first?

Other methods to consider: Outlining and Mind Mapping (Webbing)



Outlining and Mind Mapping (Webbing) are also great ways to organize information before you begin to write. They can often help to sort the information into neatly focused paragraphs.

There are many good (and free!) outlining and mind mapping (webbing) apps and websites available to assist you with organizing your writing.

Supporting Paragraphs



Each supporting paragraph should “tackle” only one point of the thesis statement. Think of being a lawyer in a court room – how would you “defend” your thesis if it were on trial? What information could you use to make your point? Are some points more important than others? Is there a logical order to the information you are presenting (If not, there should be!)?

Transitional Devices – the Cheese and Mustard that Hold it Together



A hamburger that is sloppily put together is difficult to eat. The insides fall out of the bun and make a mess! So it is with the essay. We need to put the essay together so that each part sticks to the other. We do this with transitional devices.

What are Transitional Devices?



Transitional devices are words and phrases that link ideas, sentences and paragraphs. They help the essay (or paragraph) flow easily.

Words and phrases like: therefore, because, however, albeit, also, in addition to, as a result, furthermore, hence, in conclusion, to reiterate....

What words or phrases have you used, read or heard to help essays and conversations flow?

Let's Write!



Take some time to organize your material and your thoughts. Use tools such as outlines and mind maps or webs to help you.

Write your first draft. Do not shoot for publication quality in your first draft.

If you are using information directly from someone, give them credit.

Paraphrase as much information as you can. Make sure you know the difference between paraphrasing and plagiarism

It's a Little Drafty (pardon the pun)!



Revise in your second draft. Add material you may have missed, and delete information that has been repeated (unless you are going for repetition as an effect).

Edit for spelling, grammar and general flow in your third draft.

Polish if necessary in your fourth draft.

Celebrate



Congratulations!
You are a writer!



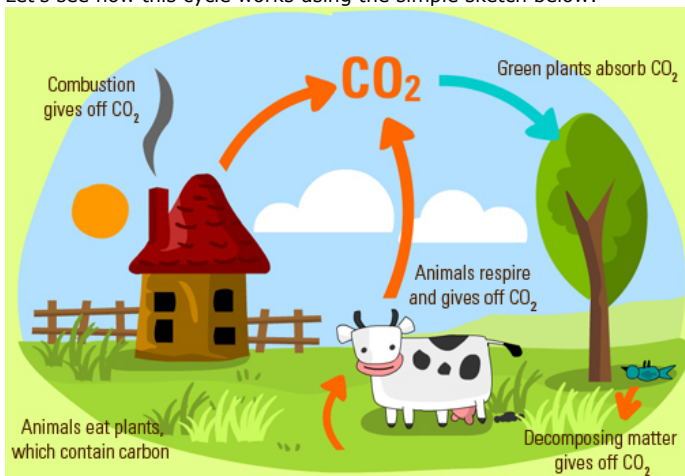
your cool facts and tips on ecosystems

What is The Carbon Cycle?

The carbon cycle is very important to all ecosystems, and ultimately life on earth. The carbon cycle is critical to the food chain.

Living tissue contain carbon, because they contain proteins, fats and carbohydrates. The carbon in these (living or dead) tissues is recycled in various processes.

Let's see how this cycle works using the simple sketch below:



Human activities like heating homes and cars burning fuels (combustion) give off carbon into the atmosphere. During respiration, animals also introduce carbon into the atmosphere in the form of carbon dioxide.

The Carbon dioxide in the atmosphere is absorbed by green plants (producers) to make food in photosynthesis.

When animals feed on green plants, they pass on carbon compounds unto other animals in the upper levels of their food chains. Animals give off carbon dioxide into the atmosphere during respiration.

Carbon dioxide is also given off when plants and animals die. This occurs when decomposers (bacteria and fungi) break down dead plants and animals (decomposition) and release the carbon compounds stored in them.

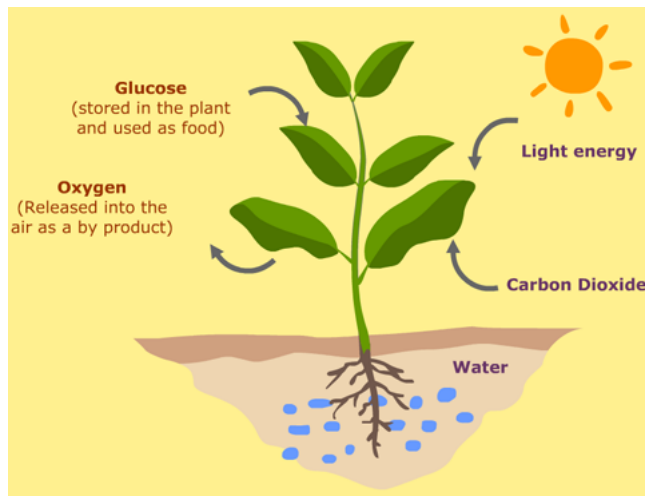
Very often, energy trapped in the dead materials becomes fossil fuels which is used as combustion again at a later time.

<http://eschooltoday.com/ecosystems/the-carbon-cycle.html>

Photosynthesis

What is photosynthesis?

Photosynthesis is a chemical process through which plants, some bacteria and algae, produce **glucose and oxygen** from carbon dioxide and water, using only light as a source of energy.



This process is extremely important for life on earth as it provides the oxygen that all other life depend on.

What does the plant need glucose (food) for?

Just like humans and other living things, plants also need this food for many things. Let's see a few:

- Glucose resulting from photosynthesis is used during respiration to release energy that the plant needs for other life processes.
- The plant cells also convert some of the glucose into starch for storage. This can then be used when the plant needs them. This is why dead plants are a used as biomass, because they have stored chemical energy in them)
- Glucose is also needed to make other chemicals such as proteins, fats and plant sugars that are all need for the plant to carry out essential growth and other life processes.

<http://www.eschooltoday.com/photosynthesis/what-is-photosynt...>

Photosynthesis

Conditions for photosynthesis

Below are things that plants need for photosynthesis:

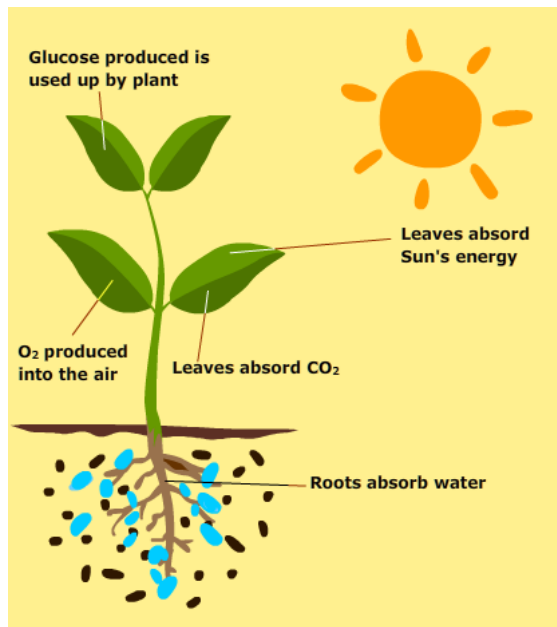
- Carbon dioxide (A colorless, naturally occurring odorless gas found in the air we breathe. It has a scientific symbol CO₂. CO₂ is produced by burning carbon and organic compounds. It is also produced when plants and animals breathe out during respiration)
- Water
- Light (Even though both natural and artificial light is OK for plants, natural sunlight is usually great for photosynthesis because they have other natural UV properties that help the plant)
- Chlorophyll (This is the green pigment found in the leaves of plants)
- Nutrients and minerals (Chemicals and organic compounds which the plant-roots absorb from the soil)

Below are things that plants make by photosynthesis:

- Glucose
- Oxygen



(light energy is shown in brackets because it is not a substance)



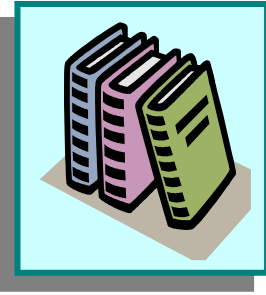
NOTES

Plants get CO₂ from the air through their leaves, and water from the ground through their roots. Light energy comes from the sun.

The oxygen produced is released into the air from the leaves. The glucose produced can be turned into other substances, such as starch, which is used as a store of energy. This energy can be released by respiration.

If factors that aid in photosynthesis are absent or less, it can negatively affect the fruits of the plant. For example, less light, insects that chew on leaves, less water can make plants such as (tomato plant) suffer and produce less yield.

<http://www.eschooltoday.com/photosynthesis/conditions-for-ph...>



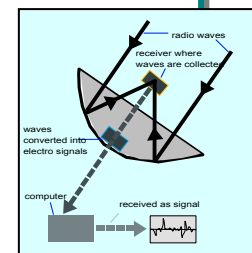
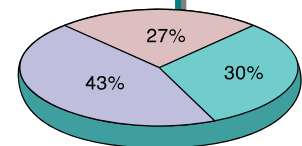
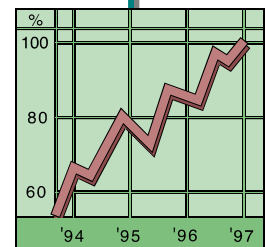
Reading Diagrams, Charts, Graphs and Tables

Some texts use only words to tell a story or give information. Other texts include pictures or photographs. Still other texts include diagrams, charts, graphs or tables to show certain information. Being able to read diagrams, charts, graphs and tables will help you understand these texts better.

Know different types of diagrams, charts, graphs and tables

Different types of diagrams, charts, graphs and tables are used to give different kinds of information. Some common types are:

- Line graph or bar graph: used to show changes over a period of time (e.g., the population of a city over the last 100 years), or the relationship between one variable and another (e.g., the number of times people in five different cities go to the movies each year).
- Pie chart (also called circle chart): used to show percentages of a total; e.g., percentage of people whose favourite food is pizza, ice cream or sandwiches.
- Scientific or technical diagram: used to show parts of an object or how something works; e.g., how a satellite dish converts radio waves into a signal.
- Table: used to summarize information about a topic into several categories; e.g., names and political parties of prime ministers of Canada, and the dates they served as prime minister.

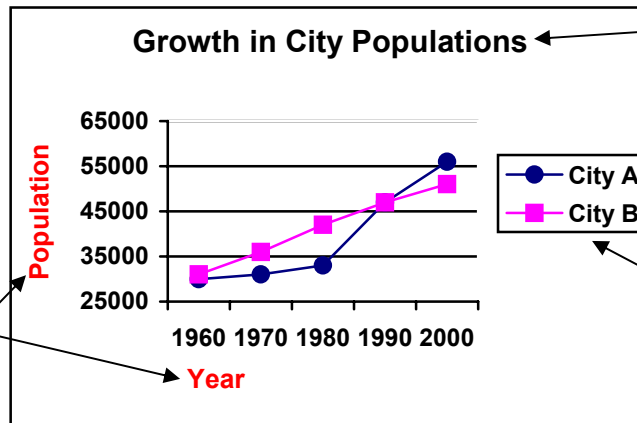


| Prime Minister | Political Affiliation | Term |
|--------------------|--------------------------|-------------------------|
| Paul Martin | Liberal | 2003.12.12 - |
| Jean Chrétien | Liberal | 1993.11.04 - 2003.12.11 |
| Kim Campbell | Progressive Conservative | 1993.06.25 - 1993.11.03 |
| Brian Mulroney | Progressive Conservative | 1984.09.17 - 1993.06.24 |
| John Napier Turner | Liberal | 1984.06.30 - 1984.09.16 |
| Pierre Trudeau | Liberal | 1980.03.03 - 1984.06.29 |

Look at the title, labels and legend

The **title** will tell you what the diagram, chart, graph or table is about. The **labels** tell you what each *part* of the diagram, chart, graph or table is showing. You might also see a **legend** that will tell you what the symbols or colours represent.

These labels tell you that the graph shows populations for the years 1960 to 2000. This tells you that the higher a point is on the graph, the larger population it represents, and the farther it is to the right, the later date it represents.



This title tells you that the graph shows how the number of people in certain cities grew over a period of time.

This legend tells you that the blue line with round points shows City A, while the pink line with square points shows City B.

Look for context clues

Read the text near the diagram, chart, graph or table. Often there will be a description of the diagram, chart, graph or table, or a summary about what it contains. For example, near the graph shown above, you might see a sentence that says "The population in both cities increased significantly, but while City B increased more gradually, City A had a rapid growth in population during the last twenty years." This can help you figure out the different parts of the diagram, chart, graph or table, and find specific information you may need.

*This tool is reproduced from The Knowledge and Employability Studio (Strategies for Reading Diagrams, Charts, Graphs and Tables), Alberta Education.

Read to Live

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Charts and Graphs

Choosing the Right Format

A picture is worth a thousand words.

This is certainly true when you're presenting and explaining data. You can provide tables setting out the figures, and you can talk about numbers, percentages and relationships forever. However, the chances are that your point will be lost if you rely on these alone.

Put up a graph or a chart, and suddenly everything you're saying makes sense! Graphs or charts help people understand data quickly. Whether you want to make a comparison, show a relationship, or highlight a trend, they help your audience "see" what you are talking about.



© iStockphoto

The trouble is there are so many different types of charts and graphs that it's difficult to know which one to choose. Click on the chart option in your spreadsheet program and you're presented with many styles. They all look smart, but which one is appropriate for the data you've collected?

Can you use a bar graph to show a trend? Is a line graph appropriate for sales data? When do you use a pie chart? The spreadsheet will chart anything you tell it to, whether the end result makes sense or not. It just takes its orders and executes them!

To figure out what orders to give, you need to have a good understanding of the mechanics of charts, graphs and diagrams. We'll show you the basics using four very common graph types:

- Line graph
- Bar graph
- Pie chart
- Venn diagram

First we'll start with some basics.

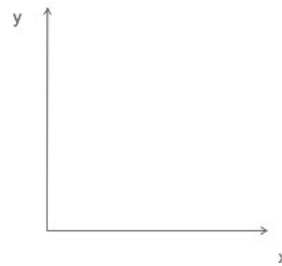
X and Y Axes – Which is Which?

To create most charts or graphs, excluding pie charts, you typically use data that is plotted in two dimensions, as shown in Figure 1.

- The horizontal dimension is the x-axis.
- The vertical dimension is the y-axis.

http://www.mindtools.com/pages/article/Charts_and_Diagrams.htm

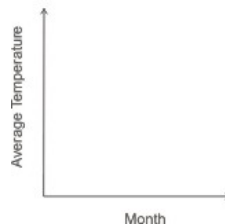
Figure 1: X and Y Axes

**Tip:**

To remember which axis is which, think of the x-axis as going **a**long the corridor and the y-axis as going **u**p the stairs – the letter "a" comes before "u" in the alphabet, just as "x" comes before "y."

When you come to plot data, the known value goes on the x-axis and the measured (or "unknown") value on the y-axis. For example, if you were to plot the measured average temperature for a number of months, you'd set up axes as shown in Figure 2:

Figure 2: The known value goes on the x axis and the measured value on the y axis



The next issue you face is deciding what type of graph to use.

Line Graphs

One of the most common graphs you will encounter is a line graph. Line graphs simply use a line to connect the data points that you plot. They are most useful for showing trends, and for identifying whether two variables relate to (or "correlate with") one another.

Trend data:

- How do sales vary from month to month?
- How does engine performance change as its temperature increases?

Correlation:

- On average, how much sleep do people get, based on their age?
- Does the distance a child lives from school affect how frequently he or she is late?

You can only use line graphs when the variable plotted along the x-axis is continuous – for example, time, temperature or distance.

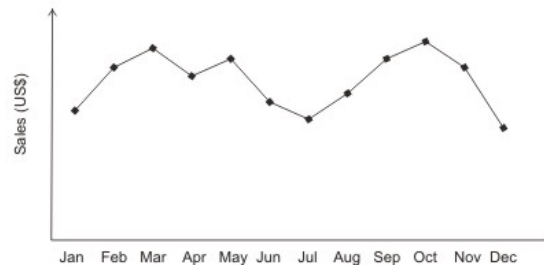
Note:

When the y-axis indicates a quantity or percent and the x-axis represents units of time, the line graph is often referred to as a time series graph.

Example:

ABC Enterprises' sales vary throughout the year. By plotting sales figures on a line graph, as shown in Figure 3, it's easy to see the main fluctuations during the course of a year. Here, sales drop off during the summer months, and around New Year.

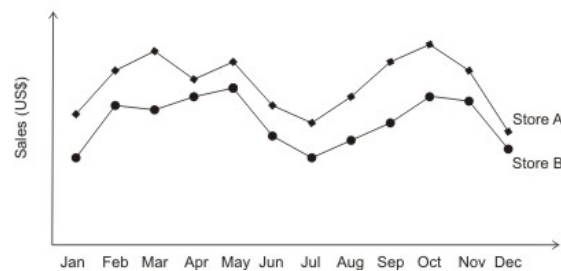
Figure 3: Example of a Line Graph



While some seasonal variation may be unavoidable in the line of business ABC Enterprises is in, it may be possible to boost cash flows during the low periods through marketing activity and special offers.

Line graphs can also depict multiple series. In this example you might have different trend lines for different product categories or store locations, as shown in Figure 4 below. It's easy to compare trends when they're represented on the same graph.

Figure 4: Example of a Line Graph with Multiple Data Series



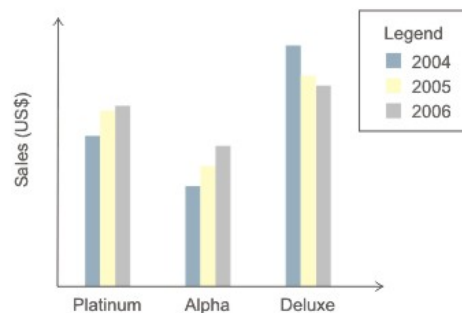
Bar Graphs

Another type of graph that shows relationships between different data series is the bar graph. Here the height of the bar represents the measured value or frequency: The higher or longer the bar, the greater the value.

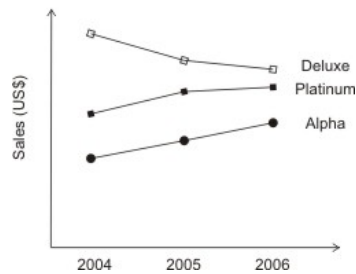
Example:

ABC Enterprises sells three different models of its main product, the Alpha, the Platinum, and the Deluxe. By plotting the sales each model over a three year period, it becomes easy to see trends that might be masked by a simple analysis of the figures themselves. In Figure 5, you can see that, although the Deluxe is the highest-selling of the three, its sales have dropped off over the three year period, while sales of the other two have continued to grow. Perhaps the Deluxe is becoming outdated and needs to be replaced with a new model? Or perhaps it's suffering from stiffer competition than the other two?

Figure 5: Example of a Bar Chart



Of course, you could also represent this data on a multiple series line graph as shown in Figure 6.

Figure 6: Data from Figure 5
Shown on a Line Graph

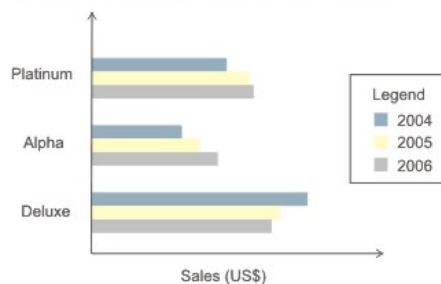
Often the choice comes down to how easy the trend is to spot. In this example the line graph actually works better than the bar graph, but this might not be the case if the chart had to show data for 20 models rather than just three. It's worth noting, though, that if you can use a line graph for your data you can often use a bar graph just as well.

The opposite is not always true. When your x-axis variables represent discontinuous data (such as different products or sales territories), you can only use a bar graph.

In general, line graphs are used to demonstrate data that is related on a continuous scale, whereas bar graphs are used to demonstrate discontinuous data.

Data can also be represented on a horizontal bar graph as shown in Figure 7. This is often the preferred method when you need more room to describe the measured variable. It can be written on the side of the graph rather than squashed underneath the x-axis.

Figure 7: Example of a Horizontal Bar Graph



Note:

A bar graph is not the same as a histogram. On a histogram, the width of the bar varies according to the range of the x-axis variable (for example, 0-2, 3-10, 11-20, 20-40 and so on) and the area of the column indicates the frequency of the data. With a bar graph, it is only the height of the bar that matters.

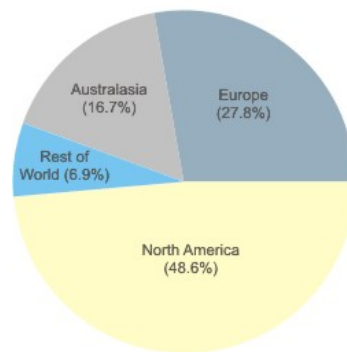
Pie Charts

A pie chart compares parts to a whole. As such it shows a percentage distribution. The entire pie represents the total data set and each segment of the pie is a particular category within the whole.

So, to use a pie chart, the data you are measuring must depict a ratio or percentage relationship. You must always use the same unit of measure within a pie chart. Otherwise your numbers will mean nothing.

The pie chart in Figure 8 shows where ABC Enterprise's sales come from.

Figure 8: Example of a PieChart

**Tip 1:**

Be careful not to use too many segments in your pie chart. More than about six and it gets far too crowded. Here it is better to use a bar chart instead.

Tip 2:

If you want to emphasize one of the segments, you can detach it a bit from the main pie. This visual separation makes it stand out.

Tip 3:

For all their obvious usefulness, pie charts do have limitations, and can be misleading. Click [here](#) for a thoughtful argument against use of pie charts. (Thanks to Anne Chappuis for the reference.)

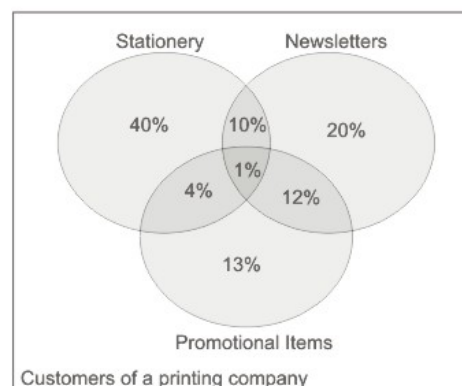
Venn Diagram

The last graph we will cover here is the Venn diagram. Devised by the mathematician John Venn in 1881, this is a diagram used to show overlaps between sets of data.

Each set is represented by a circle. The degree of overlap between the sets is depicted by the overlap between circles.

Figure 9 shows sales at Perfect Printing. There are three product lines: stationery printing, newsletter printing, and customised promotional items such as mugs.

Figure 9: An example of a Venn Diagram



By separating out the proportions of the business' customers that buy each type of product, it becomes clear that the majority of the biggest group of customers (55% of the total) – those who have their company stationery printed – are only using Perfect Printing for stationery. It's possible that they don't realise that Perfect Printing could also print their company newsletters and promotional items. As a result, Perfect Printing should consider designing some marketing activity to promote these product lines to its stationery customers.

Customers who get their newsletters printed by Perfect Printing, on the other hand, seem to be well aware that the company also offers stationery printing and promotional items.

A Venn diagram is a great choice to use when you are trying to convey the amount of commonality or difference between distinct groups.

Key Points

There are many chart and diagram formats you can choose from when representing information graphically. Selecting the right type starts with a good understanding of how each is created.

When you are clear about the specific sort of data the main types can be used to represent, you will be much more comfortable using the different types of chart in your analysis. This will add great value and improve the clarity and effectiveness of your communication.

Apply This To Your Life

- Next time you are wading through piles of numbers or analyzing relationships between variables, stop and consider how you could summarize the information you are gathering. How could you synthesize this information so that your conclusions, recommendations, or assumptions are clear and understood?
- Try creating a few of the example charts using Excel or some other spreadsheet or chart-making software. Get comfortable entering data and creating the charts so that when it comes time to create one for real, you are prepared.
- When you read material, be aware of the charts and diagrams presented. Ask yourself whether the author or presenter used the right chart for the job? What other types of charts could have been used? Why do you think he or she decided to use that type of chart? Critique the charts you see and use the information to improve your own chart-making ability.

Name: _____ Date: _____

Measuring Damage

The Fujita scale, also known as the F-scale, is used to rate a tornado's strength based on the amount of damage it creates. The strongest tornadoes ever recorded were F5s. Read the chart to see the damage done by each category of tornado. Then answer the questions.

| The Fujita Scale | | |
|------------------|----------------------|---|
| F-Scale Category | Estimated Wind Speed | Damage |
| F0 | Less than 85 mph | Light: Damage to chimneys and signs; small trees uprooted (pulled out of the ground). |
| F1 | 86–110 mph | Moderate: Pieces of roofs blown off; mobile homes turned over; moving cars pushed off the road. |
| F2 | 110–135 mph | Considerable: Entire roofs torn off houses; mobile homes destroyed; large trees uprooted; cars lifted. |
| F3 | 136–165 mph | Severe: Roofs and walls torn off houses; most forest trees uprooted; heavy cars lifted from the ground and thrown. |
| F4 | 166–200 mph | Devastating: Houses destroyed; small houses sent airborne. |
| F5 | Greater than 200 mph | Incredible: Bigger, more sturdy homes lifted and thrown; cars tossed distances more than 100 meters; tree bark stripped. |

SOURCE: WWW.NOAA.GOV. NOTE: WE ARE USING THE RECENTLY-DEVELOPED ENHANCED FUJITA SCALE.

1. What is the estimated wind speed of an F0 tornado?

2. What is the lowest-category tornado that can move cars?

3. True or false: 270 mph is a possible wind speed for an F4 tornado.

4. What category tornado causes damage described as "severe?"

5. How much faster is the lowest estimated wind speed of an F4 than that of an F3?

BONUS

Why do you think it might be helpful for experts to measure and record the strength of a tornado using the F-scale? How might the data that they record be used?

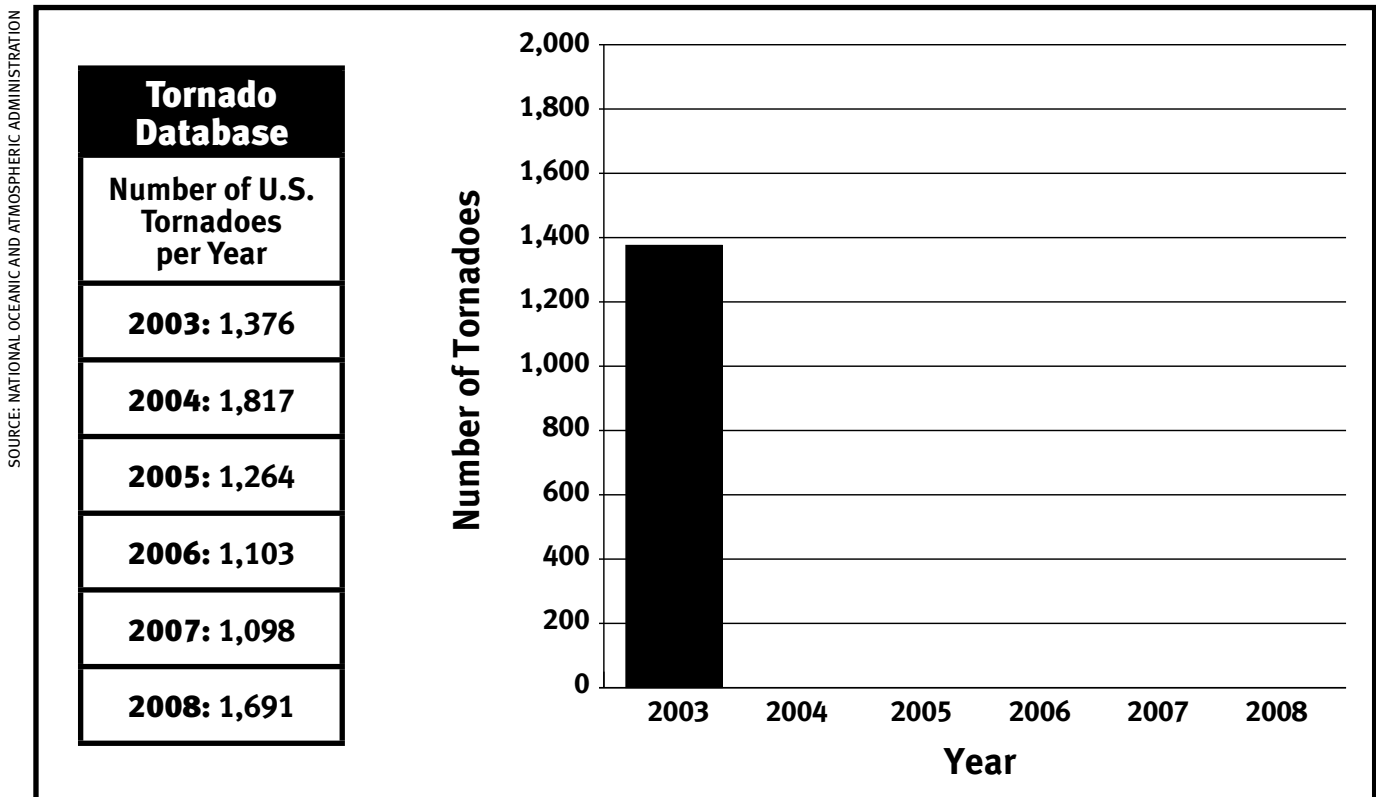


Name: _____

Date: _____

Building a Bar Graph

Tornadoes are a product of severe storms. How many tornadoes have hit the U.S. in the past six years? To find out, use the Tornado Database to build a bar graph. The first one is done for you.



1. In which year from 2003 to 2008, did the most tornadoes occur in the U.S.?

| | |
|----------|----------|
| (A) 2007 | (C) 2004 |
| (B) 2003 | (D) 2005 |
2. How many tornadoes occurred in the U.S. in 2005?

| | |
|-----------|-----------|
| (A) 1,817 | (C) 1,376 |
| (B) 1,264 | (D) 1,103 |
3. How many more tornadoes were there in the U.S. in 2004 than in 2003?

| | |
|---------|---------|
| (A) 341 | (C) 441 |
| (B) 400 | (D) 561 |
4. True or false: The number of tornadoes in the U.S. has decreased each year since 2004.

| | |
|----------|-----------|
| (A) True | (B) False |
|----------|-----------|
5. Which year saw the greatest increase in tornadoes from the previous year?

| | |
|----------|----------|
| (A) 2004 | (C) 2006 |
| (B) 2005 | (D) 2008 |
6. What was the average annual number of tornadoes from 2003 to 2008? (Round to the nearest whole number.)

| | |
|-----------|-----------|
| (A) 1,030 | (C) 1,392 |
| (B) 1,056 | (D) 1,662 |

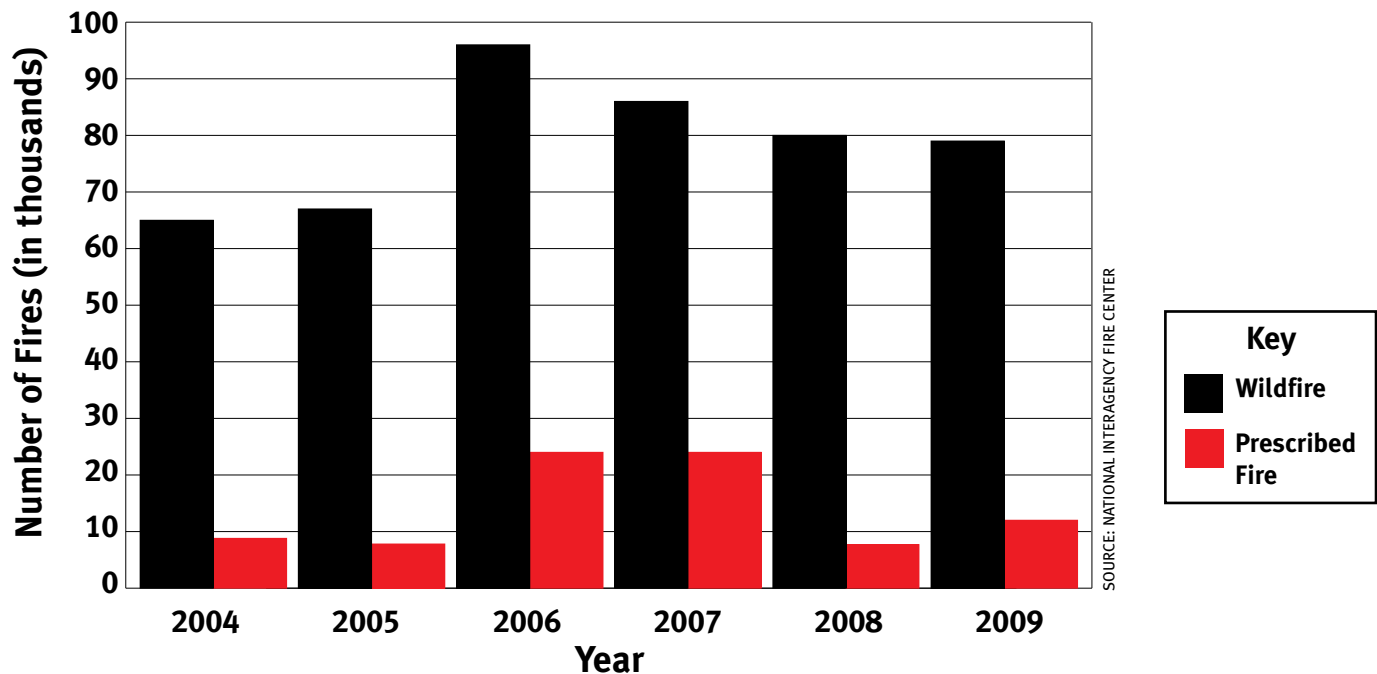
Name: _____

Date: _____

Fire Drill

Wildfires can occur at any time. But in the western United States, the blazes are most common during the fall. Environmental factors such as drought and thunderstorm activity can affect wildfire severity. Use the double-bar graph below to help you answer the following questions.

Forest Fires in the United States, 2004–2009



- About how many wildfires occurred in the U.S. in 2004?
 - (A) 9,000
 - (B) 27,000
 - (C) 65,000
 - (D) 95,000
- About how many prescribed fires were started in the U.S. in 2009?
 - (A) 12,000
 - (B) 28,000
 - (C) 23,000
 - (D) 78,000
- In what year on the graph did the most wildfires occur in the U.S.?
 - (A) 2004
 - (B) 2006
 - (C) 2007
 - (D) 2009
- In which two years was the number of prescribed fires in the U.S. about the same?
 - (A) 2004 and 2009
 - (B) 2005 and 2009
 - (C) 2006 and 2007
 - (D) 2008 and 2009
- About how many more prescribed fires occurred in the U.S. in 2006 than in 2008?
 - (A) 20,000
 - (B) 35,000
 - (C) 40,000
 - (D) 45,000
- True or false: The number of wildfires in the U.S. has steadily decreased since 2006.
 - (A) true
 - (B) false

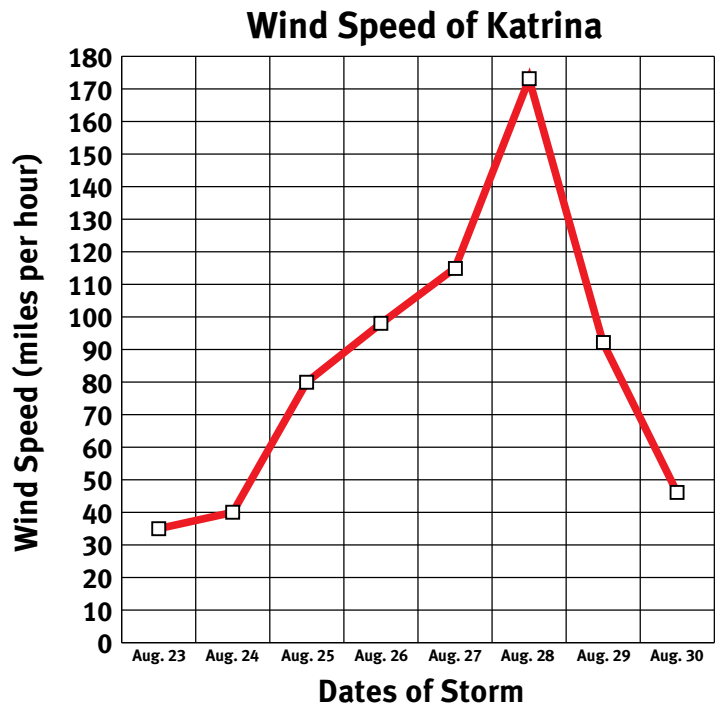


CHART SKILL

Name: _____ Date: _____

Wind Watch

Directions: Hurricane Katrina struck the Gulf Coast of the United States on August 29, 2005. Louisiana, Mississippi, and Alabama experienced the storm at its strongest. Katrina ended up being one of the fiercest and most deadly storms in U.S. history. Use the line graph and the hurricane intensity chart to answer the questions below.



| Hurricane Intensity Chart | | | | | | |
|---------------------------|----------------|---|------------|-------------|-------------|-------------------|
| Tropical Depression | Tropical Storm | Saffir-Simpson Hurricane Scale (5 Categories) | | | | |
| | | 1 | 2 | 3 | 4 | 5 |
| Less than 39 mph | 39-73 mph | 74-95 mph | 96-110 mph | 111-130 mph | 135-155 mph | More than 155 mph |

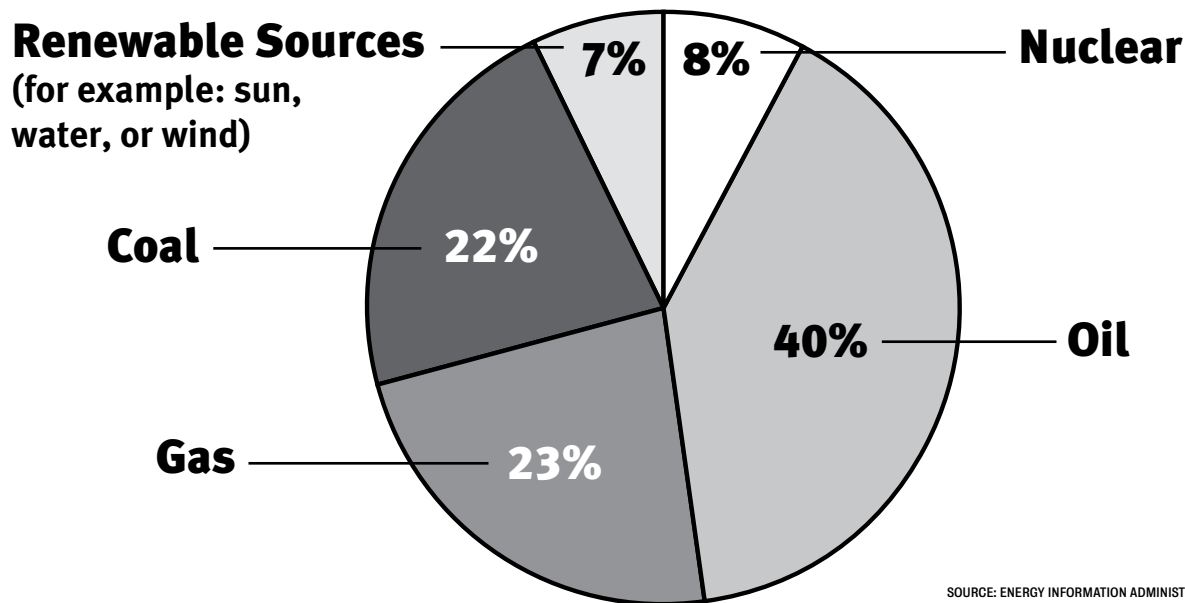
- On which day did Katrina first become a tropical storm?
 (A) August 23 (C) August 27
 (B) August 24 (D) August 30
- Katrina first made landfall over Florida on August 25, 2005. What category was the storm on that day?
 (A) tropical depression
 (B) tropical storm
 (C) Category 1
 (D) Category 2
- What category was Katrina on August 28?
 (A) Category 2 (C) Category 4
 (B) Category 3 (D) Category 5
- True or false: Katrina's winds reached their strongest point after the storm struck Florida.
 (A) True (B) False
- On which day was Katrina downgraded from a hurricane to a tropical storm?
 (A) August 30 (C) August 24
 (B) August 29 (D) August 23



Name: _____ Date: _____

Where Energy Comes From

Most energy in the United States comes from resources that can be used up, like coal and gas. The pie graph shows different energy sources used in the U.S. and the percent of total energy use that each source contributes. Read the graph, then answer the questions that follow.



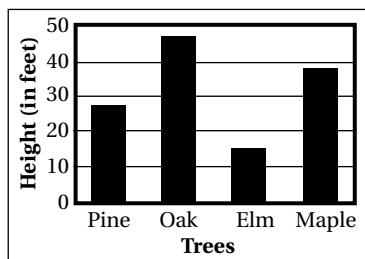
- One example of a renewable energy source is _____.
(A) gas (C) water
(B) oil (D) plastic
- Oil, gas, and coal are fossil fuels. They formed from the remains of animals that lived long ago. According to the graph, what percentage of the total energy used in the U.S. comes from fossil fuels?
(A) 48 percent (C) 85 percent
(B) 74 percent (D) 96 percent
- More than one quarter of the energy used in this country comes from _____.
(A) oil (C) gas
(B) wind (D) nuclear power
- Americans use nuclear power for _____ needs.
(A) about half of their energy
(B) more than 25 percent of their energy
(C) less than 10 percent of their energy
(D) nearly all of their energy
- When it comes to saving energy, every little bit counts. On the lines below, describe some simple things you can do to cut down on the energy you use at home.



Name: _____ Date: _____

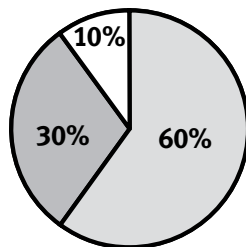
Choose Which Graph to Use

Graphs are used to help show information in a simple visual way. There are different types of graphs. Each is used to show a specific type of information. Three graphs—bar, pie, and line—are defined below. Use the definitions to complete the exercise that follows.



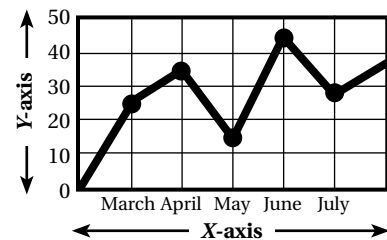
Bar Graph

A bar graph compares data about different items.



Pie Graph

Pie or circle graphs show the proportion of segments of a whole. Segments of a pie graph are usually measured in percents.



Line Graph

A line graph plots change over a period of time. The line and points are plotted against an x-axis and a y-axis.

Write the name of the graph that would best represent the information given.

- _____ 1. The percentage of fourth, fifth, and sixth graders out of the total number of students in a school of 100.
- _____ 2. The speed of the four fastest race cars (0-230 miles per hour) at the Indianapolis 500 this year.
- _____ 3. Comparison of the total number of Olympic medals won (0-50) for ice hockey by the United States, France, Canada, and Austria.
- _____ 4. The number of tourists (0 to 1 million) who travel to Seattle, Washington, each month from June through September.
- _____ 5. The percentage of kids in a school who have a laptop.
- _____ 6. The average price of a soft drink in the U.S., from 1975 to 2005.