Diagnostic Assessment for

Challenging Math Poetically

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This file contains the diagnostic assessment and scoring tools used in this mini-unit. Formative assessments and scoring tools can be downloaded from individual lesson plans incorporated within the mini-unit.

Diagnostic Assessment Instructions

Challenging Math Poetically
Diagnostic
Constructed Response /Day 1

Duration:
One 90-minute class period
Standard (s) Assessed:
MA.A.1.4.1, MA.E.1.4.1, MA.E.1.4.2, CT.B.1.4.1, CT.B.1.4.14,

Description of Assessment Activity:

The diagnostic assessment is designed to determine students' level of proficiency in problem-solving mathematical skills, basic computer skills and the ability to use a spreadsheet program.

- Part 1 – Mathematical Problem-Solving Skills: This part focuses on problem-solving techniques set in a real-world context and the interpretation of data displayed on charts, tables, and graphs.
- Part 2 – Basic Computer Skills: This consists of a checklist identifying each student's comfort zone of the computer operating system and the Internet. As a performance check, each student is required to launch an Internet browser, search for, and print a pre-selected document.
- Part 3 – Spreadsheet/Graphs: This encompasses activities for the student to complete on the computer demonstrating the ability to use a spreadsheet program.

Record results of each part of the diagnostic assessment using specially designed rubrics to provide information needed to drive the instruction.

- An Answer Key to Part 1 – Mathematical Problem-Solving Skills is provided. A Student Computer Skills Self-Check Rubric is included to allow students to review what they already know and recognize what they need to know in order to complete the learning process relative to computer skills.
- A Teacher Checklist for Part 2 – Computer Skills is included for the teacher to use to get a broad overview of the level of computer literacy for the entire class.
- A Teacher Checklist for Part 3 – Spreadsheet/Graphs checks the student's level of achievement in producing a spreadsheet and generating a variety of graphs. All diagnostic assessments and scoring tools are found in this file.

NOTE: Decide on the best plan for administering the diagnostic before the day of the assessment. Part of the computer skills check is written and part is performance. The atmosphere of the individual classroom and availability of computer technology will lend itself to the best arrangement. If necessary, divide the class into groups and rotate through the available computers. If computer labs are available, administer the computer portion in the lab and the other two parts in the regular classroom.

Materials needed:
Computers with Internet access
Printer with paper or disk for each student
Stapler

Teacher Directions:

1. Introduce the students to the mini-unit, **Challenging Math Poetically.** Go over the plan for the next seven days, briefly explaining the upcoming events. Discuss the Sunshine State Standards to be addressed and assessed. Inform students of the expectations and the assessment process.
2. Prepare the students for the diagnostic assessment by explaining that this serves as a learning tool for the teacher to acquire present knowledge of each student's mathematical and computer skills before beginning the challenge. Encourage students to do their best and answer as many questions as they can.
3. Emphasize that this is a "no stakes" assessment and will not be graded! This will eliminate "assessment anxiety" and allow students to relax and just be honest about their answers.
4. The computer skills part of the diagnostic assessment is in two parts. One part is written and one part is performance at the computer.
5. Go over the instructions for the performance part of the diagnostic and display the instructions on the overhead, if needed. The instructions are: A) Launch a Web browser, search for **GraphTypes**, and print a copy, B) Launch a spreadsheet program, produce a spreadsheet and generate three basic graphs.
6. Distribute the diagnostic assessment. Instruct students to complete Part 1 – Mathematical Problem-Solving Skills. This part of the assessment should take approximately 40 – 45 minutes depending upon the student.
7. Collect the Part 1 – Mathematical Problem-Solving Skills of the diagnostic when all have finished.
8. Instruct students to report to a computer to complete Part 2 – Computer Skills & Part 3 – Spreadsheet/Graphs. This procedure may vary depending on the availability of computers. Allow approximately 30 minutes for students to complete both of these parts.
9. Through teacher observation and the use of a check sheet, record each student's proficiency in using an efficient search method to locate and print a copy of or bookmark **GraphTypes**. Allow approximately 10 minutes for students to complete this task. Remember, this is diagnostic and students must demonstrate using **efficient** search methods.
10. The remaining 20 minutes is designated for students to complete Part 3 – Spreadsheets/Graphs. Instruct students to either print the required documents or save to a disk.
11. If printing, instruct students to staple all printed documents to their diagnostic assessments.
12. Collect Part 2 – Computer Skills & Part 3 – Spreadsheet/Graphs of the diagnostic assessment. Keep diagnostic assessments to use when the unit is complete. (See Lesson Plan #4, Picture It!)

<u>Following the diagnostic assessment:</u>

1. For homework, give each student the Student Computer Skills Self-Check Rubric in this file to rate themselves in computer skills as 1) Advanced, 2) Proficient, 3) Basic, or 4) Novice. The next day facilitate a discussion about the requirements for each of these levels. Then ask students to reevaluate in the event they did not understand the terminology. Ask for a show of hands in each category.
2. At the end of the day, use the Teacher Checklist for Part 2 – Computer skills provided in the Unit Plan Assessment File to record the class level of ability in computer skills. Use the Answer Key to Part 1 – Mathematical Problem-Solving Skills provided in the Unit Plan Assessment File to score and evaluate the mathematical skills.

3. Use the diagnostic assessments and rubrics to drive the instruction until the completion of the challenge.

At the completion of the mini-unit:

1. Return the diagnostic assessments to the students at the completion of the project once the **final evaluation** has been completed, scored, and recorded for grading purposes.
2. Engage students in discussion reflecting on their accomplishments throughout the project while reviewing the diagnostic assessment.

Student Directions:

1. Work quietly and independently on the diagnostic assessment since this is reflective of your present knowledge and is a NON-GRADED assignment. Do your best and try to answer as many of the questions as you can.
2. Complete all necessary calculations in pencil.
3. All *necessary* explanations and work must be shown according to the directions.
4. When the written part is finished, put down your pencils, turn in your papers, and follow teacher instructions for reporting to a computer to complete the performance part of the computer skills check.
5. Refer to the directions on the Part 2 – Computer Skills & Part 3 – Spreadsheet/Graphs of the diagnostic assessment or displayed on the overhead. The instructions are: 1) Launch a Web browser, search **GraphTypes**, and print a copy, 2) Launch a spreadsheet program, produce a spreadsheet and generate three basic graphs.
6. You have a maximum of 10 minutes for Part 2 and 20 minutes for Part 3 at the computer.
7. Be sure the teacher records your completion of the Internet search task at the computer.
8. Remain at the computers or return to your regularly assigned seat as directed by the teacher.

Following the diagnostic assessment:

1. Using the Student Computer Skills Self-Check Rubric rate yourselves in computer skills as 1) Novice, 2) Basic, 3) Proficient, or 4) Advanced. Indicate with a show of your hand in which category you fall following the direction of the teacher. Make a mental note where your classmates fall for future help and guidance when encountering new or difficult tasks.
2. Place computer skills self-checks in your notebooks for future reference.

Scoring Method and Criteria:

Use the answer key provided to score and assess students' mathematical problem-solving skills. Record on prepared teacher and student rubrics each student's level of proficiency with the computer while checking their accessibility and usage of a spreadsheet program. All needed documents are in this file.

Challenging Math Poetically

DIAGNOSTIC ASSESSMENT

This diagnostic assessment is designed to determine the level of proficiency in mathematical problem-solving skills and computer skills.

Part 1. Mathematical Problem-Solving Skills

Sunshine State Standards: MA.D.1.4.1, MA.E.1.4.1, and MA.E.1.4.2
Goal 3 Standards: 1 Information Managers, 3 Numeric Problem Solvers

Name: _____ Date: _____

I. As a prerequisite to problem solving, translate the following sentences into equations.

1. 20% of the cost of an item is $300. 1. _____
2. $500 less than the original price is $1250. 2. _____
3. If the length of a side of a square is squared, the area is 27.3529 sq. ft. 3. _____
4. When a certain number of five-dollar items are purchased, the product is $125. 4. _____
5. The average of an 82 and another score yields a 90. 5. _____
6. To evenly distribute 34 candy bars among 17 students find the missing factor. 6. _____
7. The length of a piece of ribbon diminished by ¾" is 2½ ". 7. _____
8. To determine the unit price of $10 find the quotient of $100 and a number. 8. _____
9. Triple the price and you receive $183. 9. _____
10. Four hundred fifty less a certain number not attending fills 380 seats. 10. _____

II. Complete each of the following problems. Show justifications and give explanations for answers using the Think, Solve, Explain format! Answers only are NOT acceptable!

1. Today is a happy day☺
   My boss decided to increase my pay.
   $18,100 I made before.
   Now I will be making even more!
   15% he did supplement.
   What amount is available to be spent?
   (Note: This is before any deductions!)

2. You would like to go to the fair.
   $2.00 tickets will put wind in your hair.
   Going with you are 5 friends.
   The cost is $5.00 for the group to get in.
   10 rides are all you have time for today.
   So, it's up to you to calculate the pay.

III. Solve the following problems using the given data.

1.

Birthdays for Jackson High		
	Boys	Girls
January	20	38
February	19	21
March	45	38
April	29	30
May	46	54
June	33	46
July	37	28
August	62	58
September	37	53
October	12	19
November	23	38
December	43	45

Answer the following questions based on the information displayed in the table at left.

What is the ratio of total boys to total girls? _____

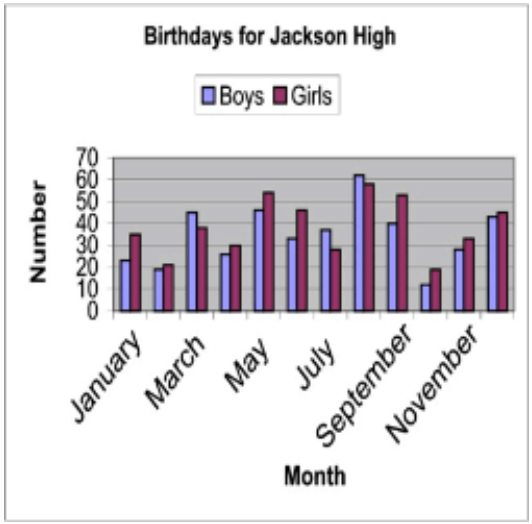
What percent of the total class are boys? _____

Identify and calculate the measures of central tendency for the girls' set of data.

Which is the most meaningful measure to describe the data?

2.

Answer the questions below based on the information displayed in the graph.



Which labeling represents the x-axis?_____
_____

Which labeling represents the y-axis?_____
_____

About how many boys attend Jackson High?
≈ _____

What conclusion can you make based on the graph?
_____
_____
_____
_____
_____

3. If you wanted to know the total number of students that attend Jackson High, from which of the graphic displays of information can you gather the more specific information – table or graph?

_____

4. Your audience is the general public. If your assignment were to produce a graphic showing how average daytime and nighttime temperatures vary in Panama City throughout the year, what type would best fit. Choose from line graph, bar graph, pie graph, or table.

_____

Part 2. Computer Skills

Sunshine State Standards: CT.B.1.4.1 & CT.B.1.4.14
Goal 3 Standards: 1 Information Managers, 7 Systems Managers

Name: _____ Date: _____

1. Check ***yes*** or ***no*** identifying whether or not you feel comfortable with each of the following criteria.

Operating System:

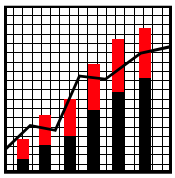
- Use active desktop to browse and manage files and folders ___yes ___no
- Open & close a spreadsheet program ___yes ___no
- Create a spreadsheet ___yes ___no
- Generate graphs from a spreadsheet ___yes ___no
- Use menu bars and execute menu commands ___yes ___no
- Use Dialog Boxes ___yes ___no
- Use Toolbars ___yes ___no
- Open multiple programs ___yes ___no
- Switch between multiple programs ___yes ___no
- Save to a file or folder ___yes ___no
- Save to a disk ___yes ___no
- Print a document ___yes ___no

Internet:

- Launch the Web browser ___yes ___no
- Locate sites by address (URL) ___yes ___no
- Navigate Web pages ___yes ___no
- Print a page from the Web ___yes ___no

Performance:

2. Launch an Internet browser, select a search engine and search **graphtypes** (no spaces). Click the link of the same name, print one copy and attach to your completed diagnostic assessment.



Part 3. Spreadsheet/Graphs

Sunshine State Standard: CT.B.1.4.14
Goal 3 Standards: 7 Systems Managers

Name: _____ Date: _____

1. Using the information below, produce a spreadsheet displaying proper organization (logical structure) without any extraneous elements. Be sure to include the following:
   a) A title for the graph
   b) Labels for the axes
   c) Appropriate and consistent scales
   d) Accurately graphed data

NOTE: Type your name at the top of the spreadsheet.

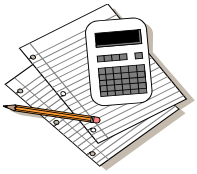
A survey was conducted for the most often purchased candy. The types of candy bars included Reese's Cups, Baby Ruth, Zero, Payday, Mounds, and Butterfinger. A total of 500 participants were surveyed. The results were as follows:

Reese's Cups:	*Male – 93, Female – 66*
Baby Ruth	*Male – 38, Female – 23*
Zero	*Male – 28, Female – 55*
Mounds	*Male – 20, Female – 23*
Butterfinger	*Male – 71, Female – 83*

2. Generate three basic graphs (line, bar, and circle) from the produced spreadsheet. Embed the three graphs in the "workbook" page containing the spreadsheet. Follow teacher directions to either print a copy and attach to this diagnostic assessment or save to a disk.

Challenging Math Poetically

DIAGNOSTIC ASSESSMENT
Answer Key



Part 1. Mathematical Problem-Solving Skills
Sunshine State Standards: MA.D.1.4.1, MA.E.1.4.1, and MA.E.1.4.2
Goal 3 Standards: 1 Information Managers, 3 Numeric Problem Solvers

I. As a prerequisite to problem solving, translate the following sentences into equations.

1. 20% of the cost of an item is $300.	1. .20x = 300
2. $500 less than the original price is $1250.	2. x – 500 = 1250
3. If the length of a side of a square is squared, the area is 27.3529 sq. ft.	3. x^2 = 27.3529
4. When a certain number of five-dollar items are purchased, the product is $125.	4. 5x = 125
5. The average of an 82 and another score yields a 90.	5. (82 + x)/2 = 90
6. To evenly distribute 34 candy bars among 17 students find the missing factor.	6. 34/17 = x
7. The length of a piece of ribbon diminished by ¾" is 2½ ".	7. x – ¾ = 2½
8. To determine the unit price of $10 find the quotient of $100 and a number.	8. 100/x = 10
9. Triple the price and you receive $183.	9. 3x = 183
10. Four hundred fifty less a certain number not attending fills 380 seats.	10. 450 – x = 380

II. Complete each of the following problems. Show justifications and give explanations for answers using the Think, Solve, Explain format! Answers only are NOT acceptable!

1. Today is a happy day☺
My boss decided to increase my pay.
$18,100 I made before.
Now I will be making even more!
15% he did supplement.
What amount is available to be spent?
(Note: This is before any deductions!)

Think: What is the problem asking? Determine the new salary.
Solve: (.15)(18100) + 18100 = x
2715 + 18100 = x
20815 = x
Explain: A 15% supplement increased the pay by $2715. Adding this to the past pay yields the new salary.

2. You would like to go to the fair.
$2.00 tickets will put wind in your hair.
Going with you are 5 friends.
The cost is $5.00 for the group to get in.

Think: What is the problem asking? Determine the total cost for you & 5 friends.
Solve: (10)(6)(2) + 5 = x
12 + 5 = x
125 = x
Explain: Each person pays $2 per ride. 10 rides at $2 each for 6 people costs $120. Add the entrance fee of $5 to get the total cost.

III. Solve the following problems using the given data.

1.

Birthdays for Jackson High		
	Boys	Girls
January	20	38
February	19	31
March	45	28
April	29	40
May	46	54
June	33	46
July	37	28
August	62	58
September	37	53
October	12	19
November	23	28
December	43	45

Answer the following questions based on the information displayed in the table at left.

What is the ratio of total boys to total girls? 406/468 or 203/234

What percent of the total class are boys? 46.45%

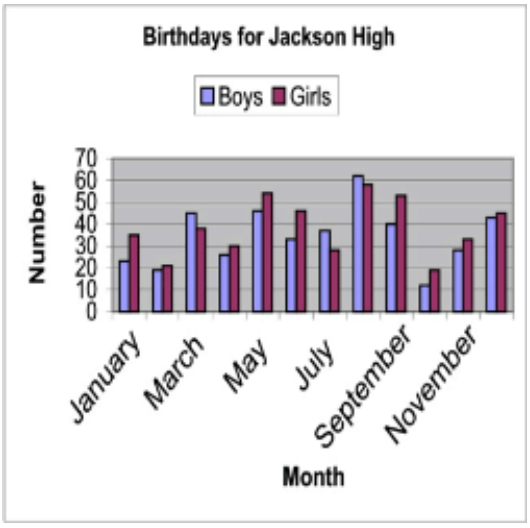
Identify and calculate the measures of central tendency for the girls' set of data.

Mean: 468/12 = 39
Median: 38
Mode: 28

Which is the most meaningful measure to describe the data? Mean

2.

Answer the questions based on the information displayed in the graph below.



Which labeling represents the x-axis? Months

Which labeling represents the y-axis? Number of birthdays

About how many boys attend Jackson High?
≈500

What conclusion can you make based on the graph?

The month of August had more birthdays for both boys and girls. The month of October had the least in both categories.

3. If you wanted to know the total number of students that attend Jackson High, from which of the graphic displays of information can you gather the more specific information – table or graph?

Table

4. Your audience is the general public. If your assignment were to produce a graphic showing how average daytime and nighttime temperatures vary in Panama City throughout the year, what type would best fit. Choose from line graph, bar graph, pie graph, or table.

The best fit would be the line graph. This type of graph shows how something changes over time.

Student Computer Skills Self-Check Rubric

CT.B.1.4.1 & CT.B.1.4.14 **Name** _____

This rubric is designed for you to examine certain computer skills and rank yourself according to levels of proficiency. This is an excellent tool to allow you to review what you already know and recognize what you need to know in order to complete the learning process. For each skill place a check (√) inside the square (☐) for your level.

Computer Skills	Level 4: Advanced	Level 3 Proficient	Level 2: Basic	Level 1: Novice
1. File Management -Use & create a spreadsheet	Can navigate through a spreadsheet program with ease/Feel confident in teaching others	Can navigate through a spreadsheet program without assistance	Can navigate through a spreadsheet program with assistance	Can open, but cannot navigate through a spreadsheet program
2. File Management -Graphs	☐ Can apply knowledge of spreadsheet program to produce various graphs/Feel confident in teaching others	☐ Can apply knowledge of spreadsheet program to produce various graphs without assistance	☐ Can apply knowledge of spreadsheet program to produce various graphs with assistance	☐ Cannot apply knowledge of spreadsheet program to produce various graphs
3. Internet -Search & Locate	☐ Can apply knowledge about Internet navigation to multiple situations ☐	☐ Can reach Internet site of choice without assistance ☐	☐ Can reach Internet site of choice with assistance ☐	☐ Can navigate the Internet, but cannot reach Internet site of choice ☐
4. Internet -Print	Can print image and text from Internet and help others ☐	Can print image and text from Internet without assistance ☐	Can print image or text from Internet with assistance ☐	Cannot print image or text from Internet ☐

Record each level of proficiency below:

Student Level:

1. File Management (use & create spreadsheet) ____
2. File Management (produce graphs) ____
3. Internet (using browser to search) ____
4. Internet (printing/transferring text) ____

Teacher Checklist for Part 2 – Computer Skills

CT.B.1.4.1 & CT.B.1.4.14

Use tally marks to indicate the number of students who indicated ***yes*** or ***no*** in each of the following categories. This represents a broad overview of the level of computer literacy for the entire class. If only a few students answered ***no*** in any one category, a seating chart could be made so those students would be seated next to students who indicated ***yes*** to the skill.

Operating Systems	**Yes**	**No**
Use active desktop…		
Open & close a spreadsheet program		
Create a spreadsheet		
Generate graphs from a spreadsheet		
Use menu bars & execute menu commands		
Use dialog boxes		
Use toolbars		
Open multiple programs		
Switch between multiple programs		
Save to file or folder		
Save to a disk		
Print a document		
Internet	**Yes**	**No**
Launch the Web browser		
Locate sites by address (URL)		
Navigate Web pages		
Print a page from the Web		

Teacher Comments:

Part 2. Computer Skills
Sunshine State Standards: CT.B.1.4.1 & CT.B.1.4.14
Goal 3 Standards: 1 Information Managers, 7 Systems Managers

Answer Key

1. Operating System and Internet

Operating System and Internet portion are based on individual student comfort zone.

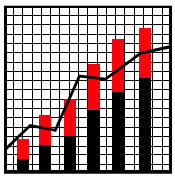
2. Performance

Using an appropriate search engine, students locate a specific document.

The document is found through Google, AltaVista, MSN, or Ask Jeeves using keywords *graphtypes* and clicking the first choice "GraphTypes."

The Website URL is
http://www.nceas.ucsb.edu/people/best/public_html/data/graph/types.html
(One-page document*)

*NOTE: This document displays basic examples of line, bar, and circle graphs. If this site is no longer available, search for a similar site that requires minimal printing but provides the same information.



Part 3. Spreadsheet/Graphs

Sunshine State Standard: CT.B.1.4.14
Goal 3 Standards: 7 Systems Managers

Name: Answer Key Date: _____

1. Using the information below, produce a spreadsheet displaying proper organization (logical structure) without any extraneous elements. Be sure to include:
   a) A title for the graph
   b) Labels for the axes
   c) Appropriate and consistent scales
   d) Accurately graphed data

A survey was conducted for the most often purchased candy. The types of candy bars included Reese's Cups, Baby Ruth, Zero, Payday, Mounds, and Butterfinger. A total of 500 participants were surveyed. The results were as follows:

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Zero	*Male – 28, Female – 55*
Mounds	*Male – 20, Female – 23*
Butterfinger	*Male – 71, Female – 83*

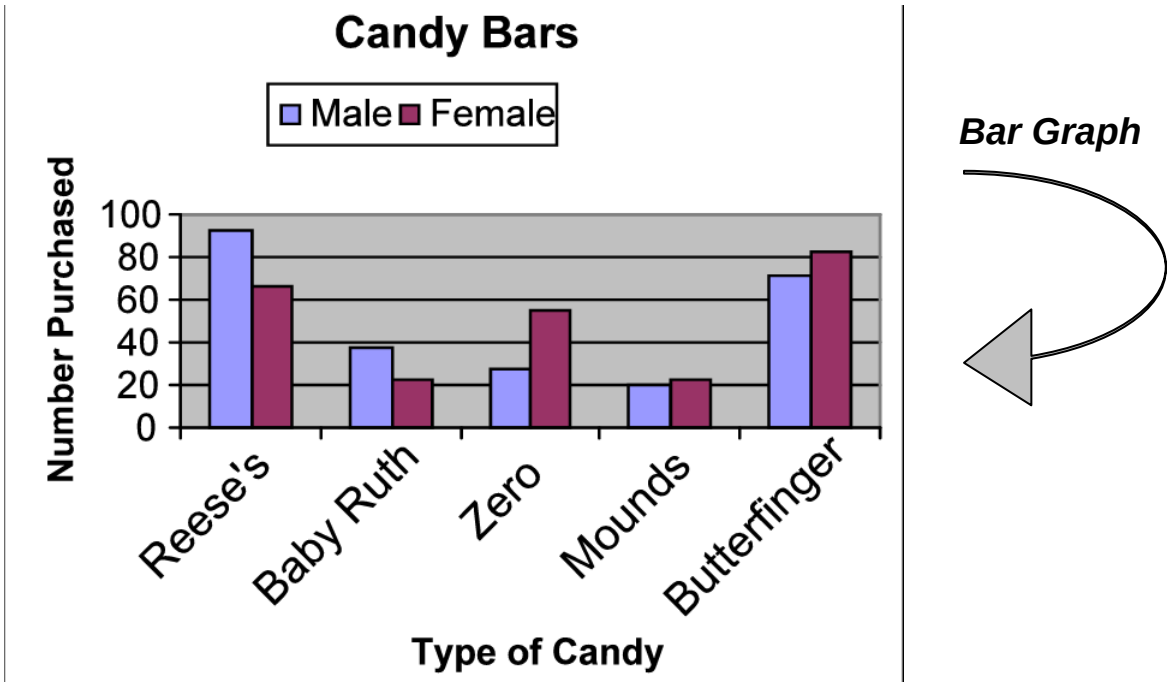
Spreadsheet Layout

Candy Bars		
	Male	*Female*
Reese's	***93***	***66***
Baby Ruth	***38***	***23***
Zero	***28***	***55***
Mounds	***20***	***23***
Butterfinger	***71***	***83***

2. Generate three basic graphs (line, bar, and circle) from the produced spreadsheet. Embed the three graphs in the "workbook" page containing the spreadsheet. Print a copy and attach to this diagnostic assessment.

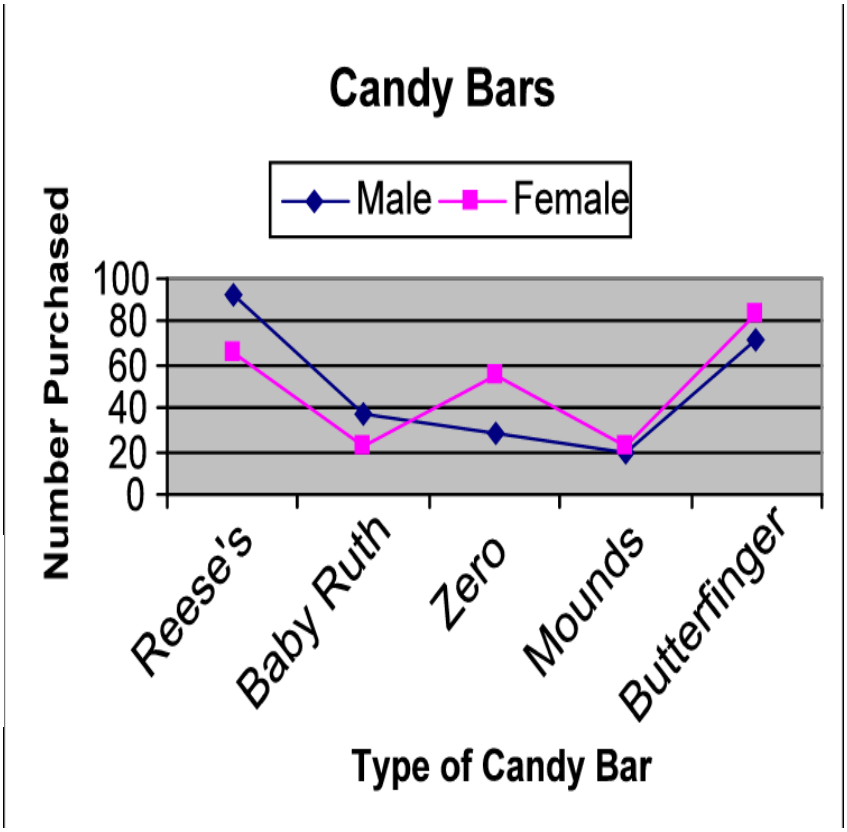
See pages 14-15 for sample graphs to be created and printed by students.

Answer Key for Spreadsheet/Graphs



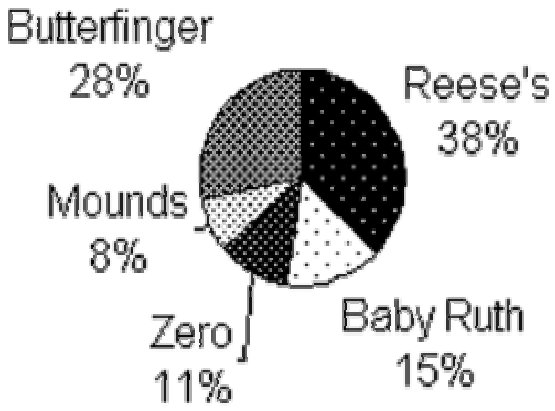
Bar Graph

Line Graph



Circle Graph

Candy Bars - Male



Teacher Checklist for Part 3 – Spreadsheet / Graphs

CT.B.1.4.14

	Spreadsheet		Graphs		
Name	**Logical Structure**	**Correct Data**	**Line Graph**	**Bar Graph**	**Circle Graph**
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
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