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Grades 7-8 Independent and Dependent Variables

Danielle Carpentieri
Pace University

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Differentiated Lesson Plan

Danielle Carpentieri

Differentiated Lesson Plan: Independent and Dependent Variables

By Danielle Carpentieri

GENERAL INFORMATION	
Course:	8th Grade Mathematics
Unit Name:	Functions
Lesson Name:	Independent and Dependent Variables
Unit and Lesson Duration:	Unit – 3 weeks Lesson – 2 days
How the lesson fits into the unit:	This lesson occurs towards the beginning of a unit on functions, a mathematical topic that deals with the relationship between two quantities, known as independent and dependent variables. Prior to learning functions, students must understand independent and dependent variables and how they relate to one another in specific situations. The goal for this lesson will be to draw upon students' intuitive awareness of cause and effect, and to apply this knowledge to authentic, real-world situations. This will give students the theoretical and conceptual foundations they will need to grasp more complex and formulaic ideas in the unit. It will also promote meaningful learning as it will show students how mathematics is relevant to their everyday lives.
THE BIG IDEAS	
Lesson Essential Questions:	▪ How can we identify independent and dependent variables in the world around us? ▪ How are mathematical concepts and language used in everyday life? ▪ How can we apply our understanding of independent and dependent variables to real-life scenarios?
Lesson Objectives:	Students will be able to: ▪ Identify independent and dependent variables in the real world. ▪ Express the relationship between specific independent and dependent variables.
New York State Mathematics Standards and Performance Indicators Addressed:	**Grade 8 Mathematics Core Curriculum** *Students will solve problems that arise in mathematics and in other contexts.* ▪ 8.PS.5: Make conjectures from generalizations.

	Students will make and investigate mathematical conjectures. ▪ 8.RP.5: Provide supportive arguments for conjectures. *Students will develop and evaluate mathematical arguments and proofs.* ▪ 8.RP.7: Develop, explain, and verify an argument using mathematical ideas and language. *Students will organize and consolidate their mathematical thinking through communication.* ▪ 8.CM.1: Provide a correct, complete, coherent, and clear rationale for thought process used in problem solving. *Students will communicate their mathematical thinking coherently and clearly to peers, teachers, and others.* ▪ 8.CM.4: Share organized mathematical ideas through the manipulation of objects, numerical tables, drawings, charts, graphs, tables, diagrams, models and symbols in written and verbal form. *Students will use the language of mathematics to express mathematical ideas precisely.* ▪ 8.CM.9: Increase their use of mathematical vocabulary and language when communicating with others. ▪ 8.CM.10: Use appropriate language, representations, and terminology when describing objects, relationships, mathematical solutions, and rationale. *Students will recognize and apply mathematics in contexts outside of mathematics.* ▪ 8.CN.6: Recognize and provide examples of the presence of mathematics in their daily lives. ▪ 8.CN.9: Recognize and apply mathematics to other disciplines, areas of interest, and societal issues. *Students will create and use representations to organize, record, and communicate mathematical ideas.* ▪ 8.R.1: Use physical objects, drawings, charts, tables, graphs, symbols, equations, and technology as representations. ▪ 8.R.2: Explain, describe, and defend mathematical ideas using representations.
LESSON SEQUENCE	
Pre-assessment:	Pre-assessment will occur prior to the lesson and will be used to determine students' levels of readiness.
Anticipatory Set or Hook:	Students will be shown a clip from the reality TV show "Dancing with the Stars." They will watch a dancer perform and see the scores and

<table>
<tr><td></td><td>commentary of the judges after the performance.

After the clip, students will be asked, “Based on the judges’ comments and your prior knowledge, what factors do you think influenced the dancer’s score?” [e.g., what variables does the score depend on? What factors will cause the score to increase? Decrease?]

(other shows which illustrate cause-effect can be substituted)

This will be a fun and interesting way to introduce the tiered assignment. In particular, it will show students that independent and dependent variables can be found in the world around us.</td></tr>
<tr><td>Tiered Assignment:</td><td>Students will be divided into three groups based on their levels of readiness, as determined by pre-assessment worksheets. For each group level, the performance assessment of the lesson will be tiered in all of the following areas.

<u>Low Group</u>

Challenge Level/Complexity
▪ will use research materials to find 5 independent variables that are related to a specific dependent variable

▪ will explain a general relationship between each of the 5 independent variables and the dependent variable, based on research. (e.g., as independent variable #1 increases, the dependent variable increases)

Resources
▪ will use at least two resources

Outcome
▪ will describe a general relationship for 5 independent variables

Product
▪ will produce a news article based on topic of interest
▪ will produce a creative piece based on learning style

Process
▪ will conduct research and look for general information

<u>Average Group</u>

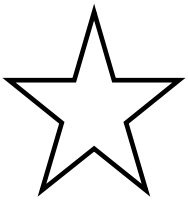
Challenge Level/Complexity
▪ will use research materials to find 5 independent variables that are related to a specific dependent variable</td></tr>
</table>

	▪ will explain a ***general*** relationship between each of the **5** independent variables and the dependent variable, based on research. (e.g., as independent variable #1 increases, the dependent variable increases) ▪ will conjecture about a ***precise*** relationship between **1** of the **5** independent variables and the dependent variable. (e.g., as independent variable #1 increases by amount x, the dependent variable increases by amount y)
	Resources
	▪ will use at least three resources
	Outcome
	▪ will describe a ***general*** relationship for 5 independent variables ▪ will conjecture about a ***precise*** relationship for 1 independent variable
	Product
	▪ will produce a news article based on topic of interest ▪ will produce a creative piece based on learning style
	Process
	▪ will conduct research and look for general information ▪ will use background knowledge and research to make a conjecture **High Group**
	Challenge Level/Complexity
	▪ will use research materials to find **5** independent variables that are related to a specific dependent variable ▪ will explain a ***general*** relationship between each of the **5** independent variables and the dependent variable, based on research. (e.g., as independent variable #1 increases, the dependent variable increases) ▪ will conjecture about a ***precise*** relationship between **2** of the **5** independent variables and the dependent variable. (e.g., as independent variable #1 increases by amount x, the dependent variable increases by amount y) ▪ will form an opinion on whether agree or disagree with **1** of the general relationships found in research
	Resources
	▪ will use at least three resources

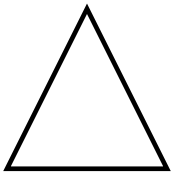
	Outcome
	▪ will describe a ***general*** relationship for 5 independent variables ▪ will conjecture about a ***precise*** relationship for 2 independent variables ▪ will express opinion
	Product
	▪ will produce a news article based on topic of interest ▪ will produce a creative piece based on learning style
	Process
	▪ will conduct research and look for general information ▪ will use background knowledge and research to make a conjecture ▪ will evaluate findings and form opinion
Anchor Activities:	Anchor activities will be provided for students who complete the tiered assignment. These activities will appeal to diverse readiness levels, interests, and learning styles.
Post-assessment:	Post-assessment will occur after the lesson. The goal of post-assessment will be to determine if students have achieved the learning objectives. This will be determined through questioning and also through students' self-assessment.

Attached please find the pre-assessment, tiered assignments and rubrics, anchor activities, and post-assessment. Rubrics were created with http://rubistar.4teachers.org/

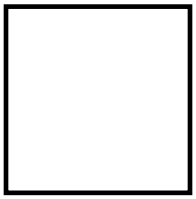
On tiered worksheets, readiness levels are signified by the following symbols. Students will not know the meaning of these symbols.



Low Level



Average Level



High Level

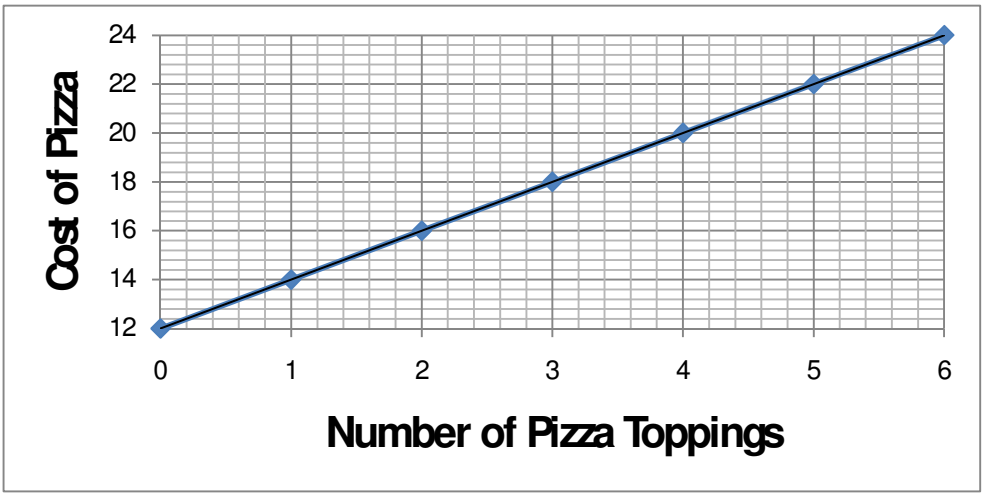
Name: _____ Date:_____

Pre-assessment

Complete the following table by writing possible independent or dependent variables.

Independent Variable	**Dependent Variable**
EXAMPLE: ***Number of hours you study for a test***	***Your test score***
1. Number of gallons in your gas tank	1.
2.	2. Your IQ (Intelligence Quotient)
3. The number of calories you eat each day	3.
4.	4. Your level of happiness

Refer to the following graph for questions 5-7.



5. What is the independent variable?

6. What is the dependent variable?

7. How are the independent and dependent variables related? (*Be as precise as you can*)

You are given the following data on the relationship between John's test score and the number of hours he studies.

# of Hours John Studies	John's Test Score
0	75
.5	80
1	85
1.5	90
2	95
2.5	100

8. What are the independent and dependent variables?

9. How are the independent and dependent variables related? (*Be as precise as you can*)

You are given the following data on the relationship between the number of dinner guests at Mary's house and the amount of time she will need to prepare dinner.

Number of Guests	Meal Preparation Time (min)
3	25
4	33
5	41
6	49
7	57
8	65

10. What are the independent and dependent variables?

11. How are the independent and dependent variables related? (*Be as precise as you can*)

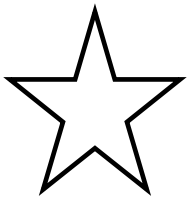
<u>Independent and Dependent Variables:</u> Around Us All the Time?

Role: You are a news reporter who has been given the job of reporting on a current, hot topic which you find interesting.

Audience: You will be preparing your report for the general public.

Format: You will choose a topic of interest to be your dependent variable. The topics are: *global warming*, *cancer, teen depression,* and *high school dropout rates.* Other topics must be approved by the teacher. Then, you will prepare a news article based on research you conduct on your topic. In addition, you will produce a creative piece that will be presented to the class.

Topic: Independent and dependent variables in the real world, as well as how they are related.



Global Warming

Global Warming News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to global warming.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically, the article must explain how each of your **5** independent variables is related to global warming, in general terms.

   For example, as population *(independent variable)* increases, global warming *(dependent variable)* increases.

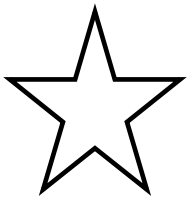
   These findings must be supported by research!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to global warming in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 2 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com
   www.factmonster.com
   www.epa.gov/globalwarming/
   http://www.nrdc.org/globalWarming/f101.asp
   http://topics.nytimes.com/top/news/science/topics/globalwarming/index.html



Cancer

Cancer News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to cancer.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically, the article must explain how each of your **5** independent variables is related to cancer, in general terms.

   For example, as a person's exposure to sunlight (*independent variable)* increases (*independent variable)*, his or her chance of developing cancer (*dependent variable)* increases.

   These findings must be supported by research!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to cancer in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 2 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com
   www.factmonster.com
   www.cancer.org
   http://www.nlm.nih.gov/medlineplus/medlineplus.html
   http://www.cancer.gov/

Teen Depression

Teen Depression News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to teen depression.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically, the article must explain how each of your **5** independent variables is related to teen depression, in general terms.

   For example, as the number of stressful events in a teen's life (*independent variable)* increases, his or her chance of developing depression (*dependent variable)* increases.

   These findings must be supported by research!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to teen depression in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 2 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com
   www.factmonster.com
   http://www.teendepression.org
   http://www.pbis/org/schoolwide.htm
   http://helpguide.org/mental/depression_teen.htm

High School Dropout Rates

High School Dropout News Reporter (not literally!),

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to high school dropout rates.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically, the article must explain how each of your **5** independent variables is related to high school dropout rates, in general terms.

   For example, as the number of weekly hours a student spends participating in extracurricular activities (*independent variable)* increases, his or her chance of dropping out of high school (*dependent variable)* decreases.

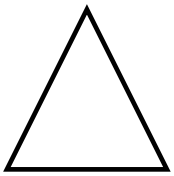
   These findings must be supported by research!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to high school dropout rates in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 2 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com
   www.factmonster.com
   http://www.cnn.com/2009/US/05/05/dropout.rate.study/index.html
   http://www.joe.org/joe/2005august/rb6.php
   http://nces.ed.gov/



Global Warming

Global Warming News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to global warming.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically,

   a) The article must explain how each of your **5** independent variables is related to global warming, in general terms.

      For example, as population *(independent variable)* increases, global warming *(dependent variable)* increases.

      These findings must be supported by research!

   b) The article must include a conjecture about a precise relationship between global warming and **1** of the independent variables.

      For example, for every population increase of 1 billion people, the temperature of the Earth will increase by 1° F.

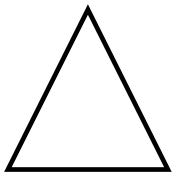
      Base your conjecture on prior knowledge or research!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to global warming in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 3 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com
   www.factmonster.com
   www.epa.gov/globalwarming/
   http://www.nrdc.org/globalWarming/f101.asp
   http://topics.nytimes.com/top/news/science/topics/globalwarming/index.html



Cancer

Cancer News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to cancer.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically,

   a) The article must explain how each of your **5** independent variables is related to cancer, in general terms.

      For example, as the number of cigarettes a person smokes (*independent variable)* increases, his or her chance of developing cancer (*dependent variable)* increases.

      These findings must be supported by research!

   b) The article must include a conjecture about a precise relationship between cancer and **1** of the independent variables.

      For example, for every 5,000 cigarettes a person smokes, his or her chance of developing cancer increases by 8%.

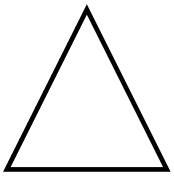
      Base your conjecture on prior knowledge or research!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to cancer in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 3 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com
   www.factmonster.com
   www.cancer.org
   http://www.nlm.nih.gov/medlineplus/medlineplus.html
   http://www.cancer.gov/



Teen Depression

Teen Depression News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to teen depression.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically,

   a) The article must explain how each of your **5** independent variables is related to teen depression, in general terms.

   For example, as the number of stressful events in a teen's life (*independent variable)* increases, his or her chance of developing depression (*dependent variable)* increases.

   These findings must be supported by research!

   b) The article must include a conjecture about a precise relationship between teen depression and **1** of the independent variables.

   For example, for every stressful event in a teen's life, his or her chance of developing depression increases by 10%.

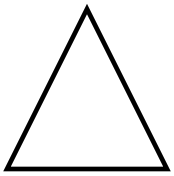
   Base your conjecture on prior knowledge or research!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to teen depression in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 3 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com
   www.factmonster.com
   http://www.teendepression.org
   http://www.pbis/org/schoolwide.htm
   http://helpguide.org/mental/depression_teen.htm



High School Dropout Rates

High School Dropout News Reporter (not literally!),

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to high school dropout rates.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically,

   a) The article must explain how each of your **5** independent variables is related to high school dropout rates, in general terms.

      For example, as the number of weekly hours a student spends participating in extracurricular activities (*independent variable)* increases, his or her chance of dropping out of high school (*dependent variable)* decreases.

      These findings must be supported by research!

   b) The article must include a conjecture about a precise relationship between high school dropout rates and **1** of the independent variables.

      For example, for every hour a student spends participating in extracurricular activities each week, his or her chance of dropping out of high school decreases by 5%.

      Base your conjecture on prior knowledge or research!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to high school dropout rates, in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 3 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com
   www.factmonster.com
   http://www.cnn.com/2009/US/05/05/dropout.rate.study/index.html
   http://www.joe.org/joe/2005august/rb6.php
   http://nces.ed.gov/

Global Warming

Global Warming News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to global warming.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically,

   a) The article must explain how each of your **5** independent variables is related to global warming, in general terms.

      For example, as population *(independent variable)* increases, global warming *(dependent variable)* increases.

      These findings must be supported by research!

   b) The article must include conjectures about a precise relationship between global warming and **2** of the independent variables.

      For example, for every population increase of 1 billion people, the temperature of the Earth will increase by 1° F.

      Base your conjectures on prior knowledge or research!

   c) For **1** of the general relationships found in part a), you must state whether you agree or disagree with the relationship. You must explain and defend your position!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to global warming in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 3 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com, www.factmonster.com, www.epa.gov/globalwarming/
   http://www.nrdc.org/globalWarming/f101.asp,
   http://topics.nytimes.com/top/news/science/topics/globalwarming/index.html

Cancer

Cancer News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to cancer.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically,

   a) The article must explain how each of your **5** independent variables is related to cancer, in general terms.

      For example, as the number of cigarettes a person smokes (*independent variable)* increases, his or her chance of developing cancer (*dependent variable)* increases.

      These findings must be supported by research!

   b) The article must include conjectures about a precise relationship between cancer and **2** of the independent variables.

      For example, for every 5,000 cigarettes a person smokes, his or her chance of developing cancer increases by 8%.

      Base your conjectures on prior knowledge or research!

   c) For **1** of the general relationships found in part a), you must state whether you agree or disagree with the relationship. You must explain and defend your position!

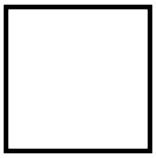
2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to cancer in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 3 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com, www.factmonster.com, www.cancer.org

   http://www.nlm.nih.gov/medlineplus/medlineplus.html, http://www.cancer.gov/



Teen Depression

Teen Depression News Reporter,

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to teen depression.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically,

   a) The article must explain how each of your **5** independent variables is related to teen depression, in general terms.

   For example, as the number of stressful events in a teen's life (*independent variable)* increases, his or her chance of developing depression (*dependent variable)* increases.

   These findings must be supported by research!

   b) The article must include conjectures about a precise relationship between teen depression and **2** of the independent variables.

   For example, for every stressful event in a teen's life, his or her chance of developing depression increases by 10%.

   Base your conjectures on prior knowledge or research!

   c) For **1** of the general relationships found in part a), you must state whether you agree or disagree with the relationship. You must explain and defend your position!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to teen depression in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

3) Prepare a list of the resources you used. You must use **at least** 3 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com, www.factmonster.com, http://www.teendepression.org
   http://www.pbis/org/schoolwide.htm , http://helpguide.org/mental/depression_teen.htm

High School Dropout Rates

High School Dropout News Reporter (not literally!),

You have been given the following job:

Using the resources provided below or others, you must find **5** independent variables that are in some way related to high school dropout rates.

After you locate your independent variables, you must complete **ALL** of the following tasks:

1) Write a news article which describes your findings. Specifically,

   a) The article must explain how each of your **5** independent variables is related to high school dropout rates, in general terms.

      For example, as the number of weekly hours a student spends participating in extracurricular activities (*independent variable)* increases, his or her chance of dropping out of high school (*dependent variable)* decreases.

      These findings must be supported by research!

   b) The article must include conjectures about a precise relationship between high school dropout rates and **2** of the independent variables.

      For example, for every hour a student spends participating in extracurricular activities each week, his or her chance of dropping out of high school decreases by 5%.

      Base your conjectures on prior knowledge or research!

   c) For **1** of the general relationships found in part a), you must state whether you agree or disagree with the relationship. You must explain and defend your position!

2) Complete **ONE** of the following creative assignments, which you will present to the class. This creative assignment **must** refer to your independent variables and it must explain or show how each of these variables is related to high school dropout rates, in general terms.

   a. Write a song or jingle
   b. Create a poster or display
   c. Deliver a news story as if you are a newscaster on TV
   d. Make a graph/diagram/chart
   e. Teach a lesson as if you are a teacher and your classmates are your students

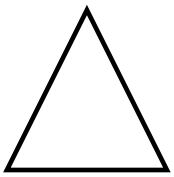
3) Prepare a list of the resources you used. You must use **at least** 3 resources to support your findings. You may choose from the resources below or from other websites, books, or magazines.

   http://school.discovery.com, www.factmonster.com,
   http://www.cnn.com/2009/US/05/05/dropout.rate.study/index.html,
   http://www.joe.org/joe/2005august/rb6.php
   http://nces.ed.gov/

RAFT Project Rubric

Student: _____

CATEGORY	4	3	2	1
Reference to Independent Variables	References are made to 5 independent variables.	References are made to 4 independent variables.	References are made to 3 independent variables.	References are made to 2 or less independent variables.
Explanation of General Relationships Between Independent Variables and Dependent Variable	Explanations are detailed and clear.	Explanations are clear.	Explanations are a little difficult to understand, but include critical components.	Explanations are difficult to understand and are missing several components OR are not included.
Creative Piece	Includes all of the independent variables and explains their relationships to the dependent variable in a clear and detailed manner. Presentation of creative piece is clear and engaging.	Includes most of the independent variables and explains their relationships to the dependent variable in a clear manner. Presentation of creative piece is clear.	Includes some of the independent variables and explains their relationships to the dependent variable in a somewhat unclear manner. Presentation of creative piece is unclear.	Includes few or none of the independent variables and explains their relationships to the dependent variable in a very unclear manner. Presentation of creative piece is very unclear and difficult to understand.
Resources	At least 2 resources are used, and all findings are supported by research.	At least 2 resources are used, but not all findings are supported by research.	1 resource is used.	No resources are used.
Neatness and Organization	The work is presented in a neat, clear, organized fashion that is easy to read.	The work is presented in a neat and organized fashion that is usually easy to read.	The work is presented in an organized fashion but may be hard to read at times.	The work appears sloppy and unorganized. It is hard to know what information goes together.



RAFT Project Rubric

Student: _____

CATEGORY	4	3	2	1
Reference to Independent Variables	References are made to 5 independent variables.	References are made to 4 independent variables.	References are made to 3 independent variables.	References are made to 2 or less independent variables.
Explanation of General Relationships Between Independent Variables and Dependent Variable	Explanations are detailed and clear.	Explanations are clear.	Explanations are a little difficult to understand, but include critical components.	Explanations are difficult to understand and are missing several components OR are not included.
Conjecture	Conjecture about relationship between 1 independent variable and the dependent variable is precise and clear.	Conjecture about relationship between 1 independent variable and the dependent variable is clear but not precise.	Conjecture about relationship between 1 independent variable and the dependent variable is unclear and not precise.	Conjecture about relationship between 1 independent variable and the dependent variable is very unclear or is missing.
Creative Piece	Includes all of the independent variables and explains their relationships to the dependent variable in a clear and detailed manner. Presentation of creative piece is clear and engaging.	Includes most of the independent variables and explains their relationships to the dependent variable in a clear manner. Presentation of creative piece is clear.	Includes some of the independent variables and explains their relationships to the dependent variable in a somewhat unclear manner. Presentation of creative piece is unclear.	Includes few or none of the independent variables and explains their relationships to the dependent variable in a very unclear manner. Presentation of creative piece is very unclear and difficult to understand.
Resources	At least 3 resources are used, and all findings are supported by research.	3 resources are used but not all findings are supported by research OR 2 resources are used.	1 resource is used.	No resources are used.
Neatness and Organization	The work is presented in a neat, clear, organized fashion that is easy to read.	The work is presented in a neat and organized fashion that is usually easy to read.	The work is presented in an organized fashion but may be hard to read at times.	The work appears sloppy and unorganized. It is hard to know what information goes together.

RAFT Project Rubric

Student: _____

CATEGORY	4	3	2	1
Reference to Independent Variables	References are made to 5 independent variables.	References are made to 4 independent variables.	References are made to 3 independent variables.	References are made to 2 or less independent variables.
Explanation of General Relationships Between Independent Variables and Dependent Variable	Explanations are detailed and clear.	Explanations are clear.	Explanations are a little difficult to understand, but include critical components.	Explanations are difficult to understand and are missing several components OR are not included.
Conjectures	Conjectures about relationships between 2 independent variables and the dependent variable are both precise and clear.	Conjectures about relationships between 2 independent variables and the dependent variable are both clear, but one or both are not precise.	Both conjectures are unclear and not precise OR one conjecture is missing.	Both conjectures are missing.
Opinion	Opinion on the general relationship between 1 independent variable and the dependent variable is clearly stated and supported.	Opinion on the general relationship between 1 independent variable and the dependent variable is clearly stated but not fully supported.	Opinion on the general relationship between 1 independent variable and the dependent variable is somewhat unclear and is not fully supported.	Opinion on the general relationship between 1 independent variable and the dependent variable is very unclear or is missing.
Creative Piece	Includes all of the independent variables and explains their relationships to the dependent variable in a clear and detailed manner. Presentation of creative piece is clear and engaging.	Includes most of the independent variables and explains their relationships to the dependent variable in a clear manner. Presentation of creative piece is clear.	Includes some of the independent variables and explains their relationships to the dependent variable in a somewhat unclear manner. Presentation of creative piece is unclear.	Includes few or none of the independent variables and explains their relationships to the dependent variable in a very unclear manner. Presentation of creative piece is very unclear and difficult to understand.

Resources	At least 3 resources are used, and all findings are supported by research.	3 resources are used but not all findings are supported by research OR 2 resources are used.	1 resource is used.	No resources are used.
Neatness and Organization	The work is presented in a neat, clear, organized fashion that is easy to read.	The work is presented in a neat and organized fashion that is usually easy to read.	The work is presented in an organized fashion but may be hard to read at times.	The work appears sloppy and unorganized. It is hard to know what information goes together.

Anchor Activities

If you finish your RAFT project, here are some activities for you to work on…
Choose the ones which you find most interesting!

1) Write a journal entry about what independent and dependent variables are, in your own words. Brainstorm other examples of independent and dependent variables from everyday life.

2) Share your thoughts with a classmate about two things which you think are related from everyday life. Document the other person's thoughts/reaction and compare and contrast them to your own. After one person shares, switch roles.

3) Make a list of movies or songs which illustrate a cause-effect relationship between two or more variables. Explain the relationships.

4) Based on the following table, make a conjecture about what the first column represents.

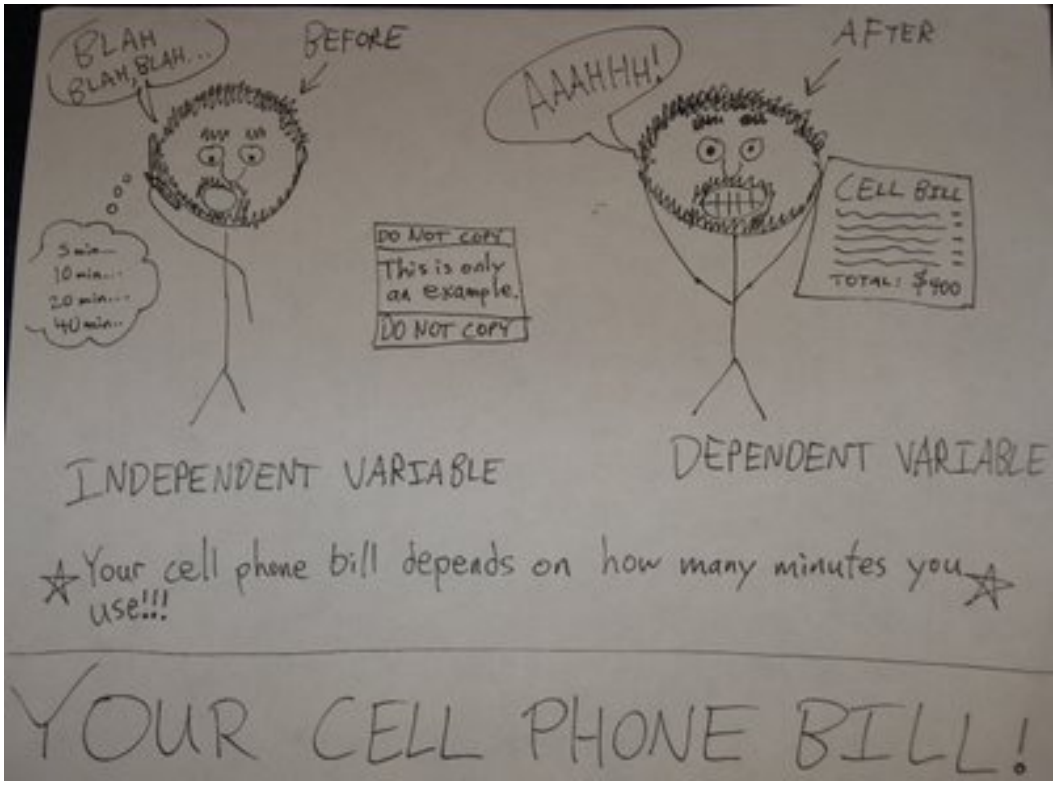
?	Monthly Cell Phone Bill
500	$25
550	$31
600	$37
650	$43
700	$49
750	$54

What is the precise relationship between the two columns?

5) Use online resources to read or listen to a famous speech in history, such as *The Gettysburg Address, I Have a Dream,* and JFK's Inaugural Address. Identify any examples of cause-effect that you read or hear. If possible, identify independent and dependent variables and explain how they are related.

6) Prepare a skit with a partner in which one person assumes the role of an independent variable and the other person assumes the role of a dependent variable. In the skit, you must identify what each person represents as well as explain how you are related to each other. The skit will be performed for the class at a later date.

7) Analyze the following picture and summarize its message. Using the picture as a model, create your own picture using different independent and dependent variables.



Name: _____ Date:_____

Post-assessment

1) What are independent and dependent variables?

2) What is a general relationship between an independent and dependent variable? What is a precise relationship?

3) Complete the following table by writing possible independent or dependent variables.

Independent Variable	**Dependent Variable**
EXAMPLE: ***Number of hours you study for a test***	***Your test score***
Number of books you read per year	
	Your annual car insurance cost
Your annual salary	
	Your level of boredom

4) Fill in the blanks with **increases** or **decreases**.

   a. As radius increases, circumference _____. (Hint: $C = 2\pi r$)

   b. As the height of a rectangle decreases, its area _____.

   c. As age _____, mobility usually _____.

   d. As temperature _____, the chance of snow _____.

SELF-ASSESS

On a scale of 1- 10, with 1 = not at all and 10 = extremely well, how well do you feel you understand independent and dependent variables?

Would you be able to teach the topic to a classmate?