

Mark Twain Boyhood Home & Museum

Lesson Plan for *Following the Equator*

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School: Wentzville RV Heritage Intermediate

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Hannibal, Missouri

LESSON PLAN FOR *The Celebrated Jumping Frog of Calaveras County*

Concept or Topic: Graphing and Analyzing Data

Suggested Grade Level: 3-5

Subject: Math and Science

Suggested Time Frame: 2 one hour lessons

Objective(s): Students will create a bar graph representing the measurements collected over three frog jumping trials with 3 variables, average the results and compare and contrast the data with 90% accuracy.

State Standards: MA 3 1.2: describe methods to collect, organize, and represent categorical and numerical data

MA 3 1.8: create tables or graphs to represent categorical and numerical data

MA 3 1.10: read and interpret information from graphs

Science: 7.1 Evidence is used to formulate explanations

Assessment Options: The final assessment will be their completed bar graph, including all the components of a bar graph. Students will also be asked to write a detailed paragraph interpreting the data represented and will prove or disprove their hypothesis.

Vocabulary: Students will review vocabulary words by playing a game of “guess the word. Teacher tapes an index card on the back of each student with one of the vocabulary words written on it. Then in a group, students ask others questions of others about their word by using the definition. Students may not ask “Am I the horizontal axis?” They may ask, “Am I the x axis or Am I the axis that goes across the paper?” When the student has guessed their word on their back, they report to the teacher and have the card removed. This game may be played several times.

Vocabulary:

Vertical axis, horizontal axis, distance, centimeter, meter, variable, question, hypothesis, outcome, conduct, average

Subject Area Integration: Other subject areas that would be integrated are communication arts.

Background Information: Students will need to have had exposure to the short story *The Celebrated Jumping Frog of Calaveras County* by Mark Twain. Students will also need to have had prior knowledge of bar graphs and how to create them, introduction to steps of the scientific method as well as an understanding of metric and customary measurement.

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Materials: Materials needed are: The Celebrated Jumping Frog of Calaveras County, rulers or meter sticks, paper (can be a graphic organizer), small paper clips, large paper clips, writing utensil and a template to create an origami frog.

Technology:

www.frogtown.org/
<http://www.frogumentary.com/>
www.twainquotes.com
<http://nces.ed.gov/nceskids>
<http://enchantedlearning.com>

Related Twain Quotes/Passages:

Supposing is good, but finding out is better. (Mark Twain Autobiography)
Every time you stop a school, you will need to build a jail. (Speech 11/23/1900)

Lesson Sequence:

Hook/Intro: Remind students of the story of Celebrated Jumping Frog of Calaveras County. Teacher will jump with empty back pack and have students predict how far teacher jumped. Students will Pair Share observations.

Teaching of the Concept:

Suggested Questions:

- How far do you think I jumped?
- What variables will change the distance I jumped?
- How does this relate to the story?
- What type of experiment can you brainstorm to test your questions and hypothesis?
- How do you think we should report the data we collect?
- What would be the best way to represent our data that is collected?

Learning Activity:

1. Students will follow written and modeled directions to create the origami jumping frog.
2. Students will need to create their question and hypothesis regarding their experiment.
3. Students will set up measurement area for jumping trials.
4. Students will practice jumping frogs. Then conduct 3 jumping trials while recording their data in metric.
5. Teacher will model and explain averaging data.
6. Students will conduct experiment with 1st variable by placing a small paper clip on the back of the frog. Students will jump frogs 3 times. Record data and average.
7. Students will conduct experiment with 2nd variable by placing a large paper clip on the back of the frog. Students will jump frogs 3 times. Record data and average.
8. Students will decide how to take collected data and create a bar graph of the averages.
9. Students will need prove or disprove their hypothesis.

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10. Students will analyze data and write a one paragraph synopsis of their findings.

Review/Closure:

Students will share results in small groups. Teacher will group 4-5 students in small groups. Students will be instructed to share graphs. Discuss how they are similar and different. Students will discuss if they proved or disproved their hypothesis and why. Students will read their synopsis to each other and using the rubric, determine if they met the standards of the rubric.

Closure: Discuss results of hypothesis and brainstorm other experiments that could be used with the jumping frog.

Homework: Exit Slip: students will take a copy of the story home and share with a family member how they integrated math, science and reading. Parent will initial the slip and student returns the form to the teacher.

Strategies for Exceptional Students:

Provide pre-made graph, have students work in small groups with assistance, provide given data for the graph, allow students to create graph using manipulatives like blocks. Gifted students may suggest other ideas for measuring and graphing, or may apply to some other area.

Suggested Follow-Up Activities:

- Create a class chart of the data; create a variety of graphs using the same data, use non-standard measurements.
- Identify endangered species of frogs and collect data regarding their expected survival, etc.
- Graph students' favorite stories, etc.
- Plan a "frog" jumping contest with students as frogs. Involve PE teacher.
- Study the lengths that other animals can jump and create a graph.

Teacher Name:

Student Name: _____

CATEGORY	4	3	2	1
Accuracy of Plot	All bars are plotted correctly and are easy to see. A ruler is used to neatly make the bars, if not using a computerized graphing program.	All bars are plotted correctly and are easy to see.	All bars are plotted correctly.	Bars are not plotted correctly OR extra points were included.
Units	All units are described (in a key or with labels) and are appropriately sized for the data set.	Most units are described (in a key or with labels) and are appropriately sized for the data set.	All units are described (in a key or with labels) but are not appropriately sized for the data set.	Units are neither described NOR appropriately sized for the data set.
Neatness and Attractiveness	Exceptionally well designed, neat, and attractive. Colors that go well together are used to make the graph more readable. A ruler and graph paper (or graphing computer program) are used.	Neat and relatively attractive. A ruler and graph paper (or graphing computer program) are used to make the graph more readable.	Lines are neatly drawn but the graph appears quite plain.	Appears messy and "thrown together" in a hurry. Lines are visibly crooked.
Data Table	Data in the table is well organized, accurate, and easy to read.	Data in the table is organized, accurate, and easy to read.	Data in the table is accurate and easy to read.	Data in the table is not accurate and/or cannot be read.
Title	Title is creative and clearly relates to the problem being graphed (includes dependent and independent variable). It is printed at the top of the graph.	Title clearly relates to the problem being graphed (includes dependent and independent variable) and is printed at the top of the graph.	A title is present at the top of the graph.	A title is not present.
Labeling of X axis	The X axis has a clear, neat label that describes the units used for the independent variable (e.g, days, months, participants' names).	The X axis has a clear label that describes the units used for the independent variable.	The X axis has a label.	The X axis is not labeled.
Labeling of y Axis	The X axis has a clear, neat label that describes the units used for the independent variable (e.g, days, months, participants' names).	The Y axis has a clear label that describes the units used for the independent variable.	The Y axis has a label	The Y axis is not labeled.

6+1 Trait Writing Model : Jumping Frogs

Teacher Name: _____

Student Name: _____

CATEGORY	4	3	2	1
Grammar & Spelling (Conventions)	Writer makes no errors in grammar or spelling that distract the reader from the content.	Writer makes 1-2 errors in grammar or spelling that distract the reader from the content.	Writer makes 3-4 errors in grammar or spelling that distract the reader from the content.	Writer makes more than 4 errors in grammar or spelling that distract the reader from the content.
Accuracy of Facts (Content)	All supportive facts are reported accurately.	Almost all supportive facts are reported accurately.	Most supportive facts are reported accurately.	NO facts are reported OR most are inaccurately reported.
Grammar & Spelling (Conventions)	Writer makes no errors in grammar or spelling that distract the reader from the content.	Writer makes 1-2 errors in grammar or spelling that distract the reader from the content.	Writer makes 3-4 errors in grammar or spelling that distract the reader from the content.	Writer makes more than 4 errors in grammar or spelling that distract the reader from the content.
Introduction (Organization)	The introduction is inviting, states the main topic and previews the structure of the paper.	The introduction clearly states the main topic and previews the structure of the paper, but is not particularly inviting to the reader.	The introduction states the main topic, but does not adequately preview the structure of the paper nor is it particularly inviting to the reader.	There is no clear introduction of the main topic or structure of the paper.
Conclusion (Organization)	The conclusion is strong and leaves the reader with a feeling that they understand what the writer is "getting at."	The conclusion is recognizable and ties up almost all the loose ends.	The conclusion is recognizable, but does not tie up several loose ends.	There is no clear conclusion, the paper just ends.