Fishing for a Fortune: The Science of Understanding our World

Author: Mike Laird
Grade Level: 6
Duration: 3 class periods

National Standards
GEOGRAPHY STANDARDS
Essential Element Four: Human Systems
10. The characteristics, distribution, and complexity of Earth's cultural mosaics.

Element Six: The uses of Geography
17. How to apply geography to interpret the past.

Common Core Standards (AZ College and Career Ready Standards)

ELA COMMON CORE
Reading Standards for 6-8 for Literacy in History/Social Studies, Science, and Technical Subjects
6-8.RH.2 Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

Writing Standards for 6-8 for Literacy in History/Social Studies, Science, and Technical Subjects
6-8.WHST.1 Write arguments focused on discipline-specific content.
6-8.WHST.2 Write informative/explanatory texts, including the narration of historical events, scientific procedures/ experiments, or technical processes.
6-8.WHST.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Other Arizona Standards
SOCIAL STUDIES STANDARDS
Strand 2 World History
PO 2. Identify the connection between current and historical events and issues using information from class discussions and various resources (e.g., newspapers, magazines, television, Internet, books, maps).

Strand 4 Geography
Concept 2: Places and Regions
PO 3. Describe the interactions of people in different places and regions.
PO 5. Describe the physical and human characteristics of places and regions of a Middle Eastern country studied.

SCIENCE STANDARDS
Strand 1: Inquiry Process
Concept 1: Observations, Questions, and Hypotheses
PO 2. Formulate questions based on observations that lead to the development of a hypothesis.
Concept 2: Scientific Testing
PO 2. Design an investigation to test
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individual variables using scientific processes.

PO 3. Conduct a controlled experiment using scientific processes.

PO 5. Keep a record of observations, notes, sketches, questions, and ideas using tools such as written and/or computer logs.

Concept 3: Analysis and Conclusions

PO 1. Analyze data obtained in a scientific investigation to identify trends.

PO 2. Form a logical argument about a correlation between variables or sequence of events (e.g., construct a cause-and-effect chain that explains a sequence of events).

PO 3. Evaluate the observations and data reported by others.

Concept 4: Communication

PO 4. Create a list of instructions that others can follow in carrying out a procedure (without the use of personal pronouns).

PO 5. Communicate the results and conclusion of the investigation.

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SIOP Elements
Preparation
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Linking to past learning
Strategies used

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Independent practice
Comprehensible input

Grouping Option
Whole class
Small groups
Partners
Independent

Education Studies Department
Teachers of Language Learners Learning Community (TLCC)

ARIZONA GEOGRAPHIC ALLIANCE
Overview

The ancients did not have today’s science and technology available to help them answer life’s questions and therefore, turned to divination as a way to find answers. So from the earliest beginnings of civilization, fortune telling has made it possible for people to explain happenings in our world whether natural or cultural, to give advice on living a good life, and to share religious guidance.
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**Purpose**

In this lesson, students will share experiences about fortune telling and then read selected passages describing a variety of fortune telling methods used over time. In order to demonstrate the conflict that often exists between divination and science, students will then follow the processes of scientific inquiry and engineering design as they investigate Fortune Teller Fish. Student teams will assume the role of Myth Busters tasked with determining whether the fish can be trusted to provide reliable fortunes. Each team will develop a conclusion based on evidence collected during its investigation and communicate its findings: “The fortune telling fish is legit!” or “busted!” This lesson includes strategies for diverse learners (ELLs).

**Key Vocabulary**

Claim: a statement of fact

Conflict: a disagreement

Culture: the arts, beliefs, customs, and institutions of a group of people

Divination: to tell the future

Evidence: facts on which to base a conclusion

Fickle: likely to change

Inquiry: to make a search or study

Oracle: a fortune teller

Passionate: intense or strong feeling

Procedure: a series of steps to accomplish a task

**Objectives**

Students will be able to:

1. Share ideas about fortune telling.
2. Identify where fortune telling has been used throughout history.
3. Discuss and record ideas outlining reasons for the conflict between fortune telling and science.
4. Design and conduct an investigation on the reliability of Fortune Teller Fish.
5. Analyze results of an experiment.
6. Write a summary detailing the results of the Fortune Teller Fish investigation.
7. Report the results of their investigation.

**Materials**

- Divination/fortune telling reading passages: Ancient Chinese Divination: Oracle Bones; Apollo’s Oracle at Delphi; Tasseography: Fortune Telling from Tea Leaves or Coffee Grinds; and Native American Dream Interpretation
- MythBusters video clip: numerous clips can be found online
- Fortune Teller Miracle Fish (one for each student)
- Divination/fortune Telling Recording Sheet
- Fortune Teller Miracle Fish I, and Fortune Teller Miracle Fish II lab sheets
- Fortune Teller Miracle Fish Scoring Guide
- Summary Scoring Guide
- Investigation materials: hand warmers, ice packs, ice, water, hand lotion, small fan, paper plates, paper bowls, paper towels, etc. I recommend setting these out prior to beginning on day one to pique student curiosity.
- Vocabulary Cards
- Vocabulary Test and Answer Key

**Procedures**

*Prior to this lesson: Set out Investigation materials (hand warmers, etc.,) prior to Session One to pique student curiosity. Send home vocabulary cards to diverse learners who may need help with these terms.*

**SESSION One**

**Engage:**

- a. Divide students into teams of 3-4 and distribute the Divination/fortune Telling Recording Sheet to each student. *(Grouping Option: Small groups)*
- b. Challenge teams to generate a list of all the fortune telling techniques they are familiar with (fortune cookies, Magic 8 Ball, Cootie Catchers, palm readers, crystal balls, etc.) and record their list on the types of fortune telling section of the Divination/Fortune Telling Recording Sheet. *(Preparation: Adapting content, Linking to Background)*
- c. Provide time for students to share, with the whole class, personal experiences they have had with fortune telling. *(Preparation: Adapting content, Linking to Background)*
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Explore, Explain, Elaborate:
a. Tell the teams they will now become an expert on information in an article and will be sharing the information via a jigsaw activity with other students. (Grouping: Small groups)
b. Distribute one of the four divination/fortune telling passages to each team and allow time for the team to read and analyze the passages. Allow teams time to prepare a summary of their article, record the summary on the Divination/Fortune Telling Recording Sheet, and rehearse what they will present to other teams. (Integrating Processes: Writing, Listening, Speaking)
c. Regroup teams into jigsaw groups and provide time for students to share summaries and record information provided by the experts on the different types of divination/fortune telling. Emphasize how these fortune telling techniques are just some of the ones that are used throughout the world. (Scaffolding: Comprehensible Input)

evaluate:
d. As a ticket out the door, each student should be able to list three ways of fortune telling and where in the world these fortune telling techniques are used. (bones-China, tea leaves or coffee grounds-Middle East, oracles-Greece, dream catchers-North America). They should also write a statement describing which of these techniques are used today and which ones are from historical times. (Assessment: Individual) (Integrating Processes: Writing)

SESSION Two and Three
Prior to Class: Students understand lab safety guidelines and behavior expectations prior to beginning investigations.

Engage:
a. Divide students into teams of 3-4. (Grouping Option: Small groups) Distribute the Fortune Teller Miracle Fish I lab sheet.
b. Write the vocabulary terms for this lesson (claim, conflict, etc.,) on the whiteboard. Ask students to record vocabulary terms on their Fortune Teller Miracle Fish I lab sheet that they cannot readily define.
c. As a class, discuss the definitions to the vocabulary words. (Scaffolding: Comprehensible Input; Grouping Option: Whole class)
d. Distribute the Fortune Teller Miracle Fish – one to each student (ask students to leave fish in the cover).

e. Ask students examine the cover and explain what the fish is for. Have students determine and explain how the fish will tell a fortune.
f. Ask students to remove fish from the cover, carefully observe the actions of the fish, and record the things they see, hear, feel, and smell in the “Observation” section of their Fortune Teller Miracle Fish I lab sheet. (Grouping Option: Independent)
g. Have students analyze and compare their observations to the fortune telling key on the fish cover in order to interpret their fortune.
h. Students record their fortune in the “My Fortune” section of the Fortune Teller Miracle Fish I lab sheet.
i. Have students write a short statement explaining why they do or do not believe their fortune. (Integrating Processes: Writing)
j. Provide students an opportunity to share their fortune and explanatory statement with the class. (Integrating Processes: Speaking, Listening)
k. Teacher (using examples of student comments) initiates discussion on the conflict that often exists between Science and divination/fortune telling. (Preparation: Adapting content, Linking to Background)
l. Tell students they have been selected as Myth Busters to determine whether the fortunes foretold by the Fortune Teller Miracle Fish are legitimate or should be busted.
m. At this point, the teacher may opt to show a video clip of one of the Discovery Channel’s Myth Buster’s segments. (Preparation: Adapting content, Linking to Background)

explore:
a. Explain to students that they will be designing and conducting a scientific investigation to determine whether the fortune told by the Fortune Teller Miracle Fish is real or should be busted.
b. Draw attention to the materials set out earlier, and tell the students that they may use these materials to try and figure out what makes the fish move.
c. Have the students brainstorm claims about what they think makes the fish move and complete the “Claims” section of their Fortune Teller Miracle Fish I lab sheet. (Grouping: Small groups)
d. Student teams will choose one claim to investigate and complete the “Claim our team will investigate” section of their Fortune Teller Miracle Fish I lab sheet.
e. Student teams will use their claim as the basis for developing a testable question. Review and approve their questions at this point. Students will record their team’s question in the “Question” section of the Fortune Teller Miracle Fish II lab
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sheet. Note: prior to student development of questions, the teacher may want to model question writing. (Scaffolding: Model, Guided practice)

f. Student teams will develop and record the procedures they will follow to test their question. Review and approve their procedures at this point. Students will record their team's procedures in the “Procedure” section of the Fortune Teller Miracle Fish II lab sheet. Note: prior to student development of investigation procedures, the teacher may want to review/model procedure writing. (Scaffolding: Model, Guided practice)

g. Student teams will collect required materials and follow their recorded procedures as they test their claim. (Application: Hands-on)

h. Students will make and record observations in the “Observation” section of their Fortune Teller Miracle Fish II lab sheet.

Explain:

a. Students will analyze and interpret their observations.

b. Students will use their insights to write a summary explaining what they discovered about the fortune told by the Fortune Teller Miracle Fish. They must conclude whether the fortune is real or busted based on the evidence collected during their investigation. (Scaffolding: Guided practice)

Elaborate:

a. Have teams prepare and practice sharing a summary report of their investigation that may be shared with other teams. (Integrating Processes: Speaking)

b. Group students into mini-conference groups to share their findings and answer questions about their investigation. (Integrating Processes: Listening and Speaking)

Evaluation:

a. Explain the Summary Scoring Guide.

b. Demonstrate how to find Concrete Evidence (an important fact) in their Fortune Teller Miracle Fish II lab sheets and then to find Commentary (details) to support their statements. (Scaffolding: Model, Guided practice)

c. Emphasize that a well-written summary will have at least three statements of Concrete Evidence and each will have at least one statement of Commentary. Summaries will also have introductory statements and a conclusion as well as correct conventions. (Assessment: Individual) (Integrating Processes: Writing)

Assessment

Geography and World History
Grade tickets out the door from Session One for correct technique of fortune telling matched to its location in the world as well as a statement as to currently used or used in historical times. Mastery will be 100%. Diverse students such as ELLs may have 75% or higher to be considered mastery.

Reading
Grade Divination/Fortune Telling Recording Sheet for completeness and accuracy. Mastery will be considered 80% or higher. Diverse students such as ELLs may have 70% or higher to be considered mastery.

Vocabulary Test can be given to assess Key Vocabulary for this lesson. Mastery will be considered 80% or higher.

Science
Fortune Teller Miracle Fish I and Fortune Teller Miracle Fish II lab sheets will be graded with the Fortune Teller Miracle Fish Scoring Guide. Mastery will be considered 40 points or higher. Diverse students such as ELLs may score 30 points or higher to be considered mastery.

Writing
Summaries will be graded with the Summary Scoring Guide. A score of 44 pts or higher will be considered mastery. Diverse students such as ELLs may have 2 statements of Concrete Evidence with Commentary to be considered mastery.

Extensions

Students:
- May conduct another team’s investigation to evaluate the clarity of the procedures.
- May conduct another team’s investigation to confirm or challenge their findings.
- Can research other parts of the world for their fortune telling practices.
- Can interview people in their family and see what beliefs they hold about fortune telling.

Sources

Background articles on divination and fortune telling:
Fishing for a Fortune: The Science of Understanding our World

1. Ancient Chinese Divination: Oracle Bones

2. Tasseography
   [http://mideastfood.about.com/od/middleeasternfood101/a/taseography.htm](http://mideastfood.about.com/od/middleeasternfood101/a/taseography.htm)

3. Native American Dream Interpretation

4. Apollo's Oracle at Delphi
   [http://greece.mrdonn.org/greekods/oracles.html](http://greece.mrdonn.org/greekods/oracles.html)

MythBusters home page