

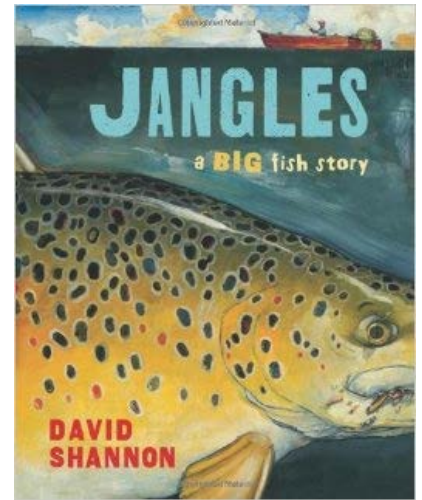
Title: STEM - Gone Fishing

Grade Level: 2nd Grade

Literacy Connection:

Jangles a Big Fish Story

By: David Shannon



STEM Content:

- Relationship between energy and forces
- Forces and motion
- The design process is a purposeful method of planning solutions to problems
- The engineering design process involves defining a problem, generating ideas, selecting a solution, testing the solution(s), making the item, evaluating it, and presenting the results
- Measure the length of an object by selecting and using appropriate tools
- Measure and estimate masses of objects using standard units of grams (g)

Big Ideas:

- Understanding of forces (weight)
- Proper use of the engineering design loop
- Measurements
- Using creativity for problem solving

Essential Question:

How can you design a fishing pole from spaghetti that can support a great amount of weight to be prepared to catch *Jangles*?

Scenario:

There is an annual fishing tournament, the person that catches the heaviest fish will receive an award. You are interested in signing up for the tournament and you know that in order to win you need to catch *Jangles* at the bottom of the lake. *Jangles* has broken many fishing poles over the years, so it is up to you to create a new, and innovative fishing pole that can catch *Jangles* and win the tournament.

Challenge:

- Working as a member of an engineering STEM team, design a fishing pole that will hold the most weight without breaking.
- Complete the engineering design loop worksheet.
- Use the tools and materials available to create a fishing pole that will resist the forces exerted by a heavy fish.
- When your design is ready to be tested, begin adding weight to the hook until the fishing pole fails. Record your results and observations on the “test for results” worksheet.
- Make the necessary changes, and retest your design.

Tools, Materials, and Resources:

Tools	Materials	Resources
<ul style="list-style-type: none">Ruler	<ul style="list-style-type: none">Spaghetti Noodles (8)Tape (10 inches)	<ul style="list-style-type: none"><i>Jangles a Big Fish Story</i>Design loop worksheetTest for Results worksheet

* The fishing hook, line, weight, and test stand will be provided.

Parameters or constraints:

- Use only tools and materials provided
- The washers (weight) may only be added to the hook one at a time
- The fishing pole must be a minimum of .45 meters long
- The fishing pole handle must be capable of being inserted into the test stand

Deliverables:

- Completion of the design loop worksheet
- Completion of the test for results worksheet
- Presentation of their final design and results

Turn in:

- Final design (the fishing pole)
- Engineering Design Loop
- Test for Results Worksheet

Content information:

What is force?

- Strength of a physical action or movement

What is weight?

- Quantity of matter providing downward gravitational force

How beams are made stronger?

- What are interlocking patterns
- What is structural integrity?
- What is lamination?
- How tension and compression can be used to our favor?

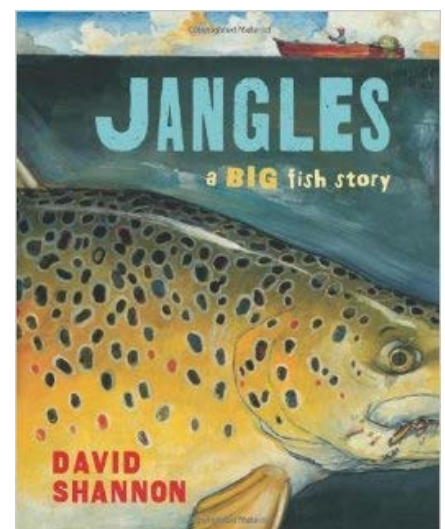
Title: STEM - Gone Fishing

Literacy Connection: *Jangles a Big Fish Story*

By: David Shannon

Essential Question: How can you design a laminated fishing pole that can hold a great amount of weight to be prepared to catch a big fish?

Scenario: There is an annual fishing tournament, the person that catches the heaviest fish will receive an award. You are interested in signing up for the tournament and you know *Jangles* lives in the



lake. *Jangles* has broken many fishing poles so it is up to you to create a new, unique fishing pole that can catch *Jangles* and win the tournament.

Challenge: Working as a member of a STEM team, design a fishing pole that will hold the most weight and not break. Before starting the design, complete the design loop worksheet. Use the tools and materials available to create a fishing pole that will resist the forces exerted by a heavy fish. When your design is ready to be tested, begin adding weight to the hook until the fishing pole fails and complete the “test for results” worksheet.

Tools, Materials, and Resources:

Tools	Materials	Resources
<ul style="list-style-type: none">• Ruler• Scale	<ul style="list-style-type: none">• Spaghetti Noodles (8)• Tape (10 inches)	<ul style="list-style-type: none">• <i>Jangles a Big Fish Story</i>• Design loop worksheet• Test for Results worksheet

** The fishing hook, line, and test stand will be provided.*

Parameters or constraints:

- Use only tools and materials provided
- The washers (weight) may only be added to the hook one at a time
- The fishing pole must be a minimum of .45 meters long
- The fishing pole handle must be capable of being inserted into the test stand



Sketch the final design or attach photo on backside of design loop!

What can be improved and shared?

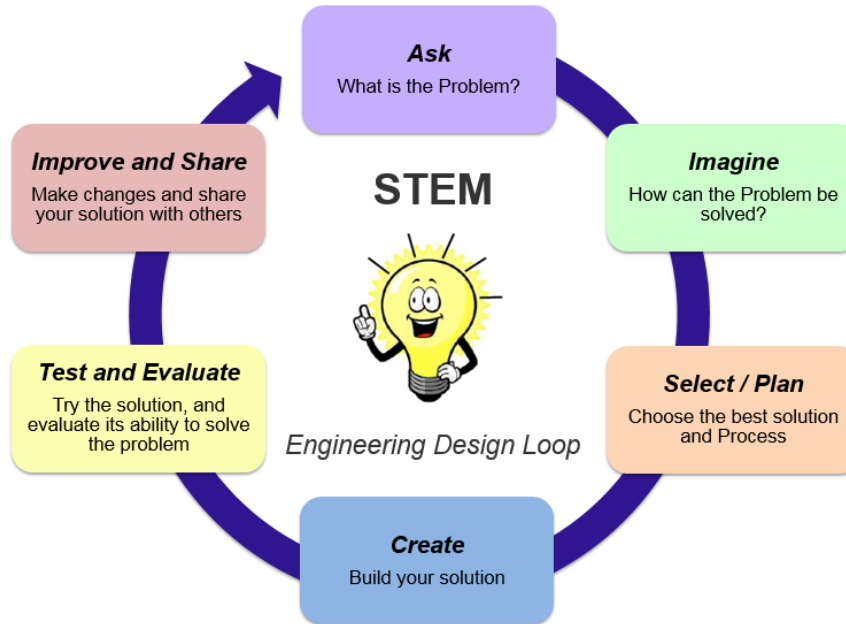
How did the design work?

What is the question asking? What are the parameters?

Idea Sketch

Idea Sketch

Idea Sketch



Describe the best idea.

Team Member Names: _____

Date: _____

Test for Results Worksheet

You should record your answers to nearest whole number, all measurements should be in grams (g).

Test #1

How many washers did your fishing pole hold?

How much do you think your washers will weigh? Estimate to the nearest whole number.

How much did the washers weigh?

Test #2

How many washers did your fishing pole hold?

How much do you think your washers will weigh? Estimate to the nearest whole number.

How much did the washers weigh?

Final Test

How many washers did your fishing pole hold?

How much do you think your washers will weigh? Estimate to the nearest whole number.

How much did the washers weigh?

Class Performance

How many washers did the most successful fishing pole in class hold?

What ideas could you borrow from other teams?



Team Member Names: _____

Date: _____

Assessment Sheet

1. Quality and strength of the completed fishing pole and presentation	_____/20
2. Design included creativity and proper use of tools and materials	_____/20
3. The Fishing Pole is able to hold some weight successfully	_____/20
4. Accurate measurements and demonstration of learning in presentation and results worksheet.	_____/20
5. Team members worked as a collaborative and successful team	_____/20
Total _____/100	

Comments: