

Saving Sponge Bob Square Pants

Grade Level Targeted: 5 – 8

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Goals/Standards:

NCOS Goals:

- Grade 5 Goal 2: Learner will make observations and conduct investigations to build an understanding of landforms.
Goal 4: Learner will conduct investigations and use appropriate technologies to build an understanding of motion in technological design.
- Grade 6 Goal 1: Learner will design and conduct investigations to demonstrate an understanding of scientific inquiry.
Goal 2: Learner will demonstrate an understanding of technological design.
- Grade 7 Goal 1: Learner will design and conduct investigations to demonstrate an understanding of scientific inquiry.
Goal 2: Learner will demonstrate an understanding of technological design.
- Grade 8 Goal 1: Learner will design and conduct investigations to demonstrate an understanding of scientific inquiry.
Goal 2: Learner will demonstrate an understanding of technological design.

National Science Standards B, E, F & G

Engineering Connection : Civil Engineering and Mechanical Engineering

Objective:

Student will devise and implement a way to move “Sponge Bob Square Pants” **safely** across open space from a higher location to a lower location without touching the floor.

Materials: Small Sponge Bob figures, masking tape, glue guns and glue, rope, string, and a variety of scraps such as foam, cardboard, parachute material, plastic bags, straws, stir sticks, spools, Styrofoam, film containers, packing material, plastic bottles, etc.

Setting up the Activity (for the facilitator):

Show students the mountain on which Sponge Bob waits (a high shelf, wall, or bookcase) and the destination he needs to reach (a spot at a lower height 20 – 40 feet away). All students will be using the same landmarks, so rescue devices must be removable.

Divide students into groups of 3 to 4.

Provide each group with a small Sponge Bob figure. For all students, provide the materials listed above. If some materials are in short supply, groups may be limited as to how much they can have.

Provide for students the following guidelines:

- **Because the floor is covered with lava, Sponge Bob, or any part of the device transporting him, may not touch the floor at any time until he reaches his destination.**
- **No members of the group may position themselves between Bob's departure site and destination during his journey to safety.**
- **Bob must come to a smooth stop so that he will come to no harm.**
- **Each group will be allowed to test their devices 2 to 3 times (depending on available time) so that adjustments can be made.**
- **After the allotted time (45 to 60 minutes) each group will get two attempts to get Bob safely to his destination.**
- **The "Expert Team" will be the one that gets Sponge Bob to his destination safely and in the shortest amount of time.**

Record times with a stopwatch

Introduction (for youth):

You are part of a Special Operations Team that has been assigned to rescue Sponge Bob Square Pants, another member of your team, from a dangerous situation. During a top secret mission, Sponge Bob has become stranded on the side of a mountain and must cross a valley in order to reach base camp at a lower altitude on the other side. The problem is that a recent volcano eruption of nearby Mt. Colossus has filled the valley with hot molten lava. The quicker he is rescued, the better his chance for survival.

Sponge Bob's location is too precarious a site for a helicopter to land, but lightweight supplies could be dropped from above. You must design a way, using the supplies available, for Sponge Bob to cross the valley safely without getting too near the hot lava.

Finishing it up (for the facilitator):

When competition is complete, lead a discussion about the activity, using the following questions. Answers will vary according to the design and success of each group.

Talking It Over:

a. Share What You Did:

- 1. How did you go about beginning your design? What things did you need to take into consideration?**
- 2. Why did your team choose the method you did?**
- 3. Was your method successful?**

b. Process What's Important:

- 4. How did you use the difference in altitudes to help in your rescue? Was gravity helpful?**
- 5. How important was balance in your design?**
- 6. What other materials might have been helpful to you?**

c. Generalize to Your Life:

- 7. Can you name anything in our daily lives that uses the same technique to move something from one place to another?**
- 8. Can you think of ways in which we use gravity to accomplish something?**

d. Apply What You Learned:

9. Do you see ways that your design might be used for a new purpose – either recreational or practical?
10. Would you need to alter your design if the start and end points were at the same altitude? How would you do that?
11. How would you alter your design if Sponge Bob needed to travel from a lower altitude to a higher one?

More Challenges:

1. Have each group write a story about the rescue, explaining Sponge Bob's mission, how he got stranded, and how he was rescued.
2. Have students research the temperature of lava and figure out how far above the lava Sponge Bob would need to be to avoid becoming Shish kaBob Square Pants.

Resources:

<http://teacher.scholastic.com/researchtools/articlearchives/volcanoes/lava.htm>
<http://www.madsci.org/posts/archives/oct98/909712615.Ph.r.html>

Glossary:

Molten: Reduced to liquid by heating.
Lava: Rock in its liquid form spewed from volcanoes.
Precarious: Dangerously insecure.

Acknowledgements: Liz Parry