

Spaghetti Bridge Building Handout

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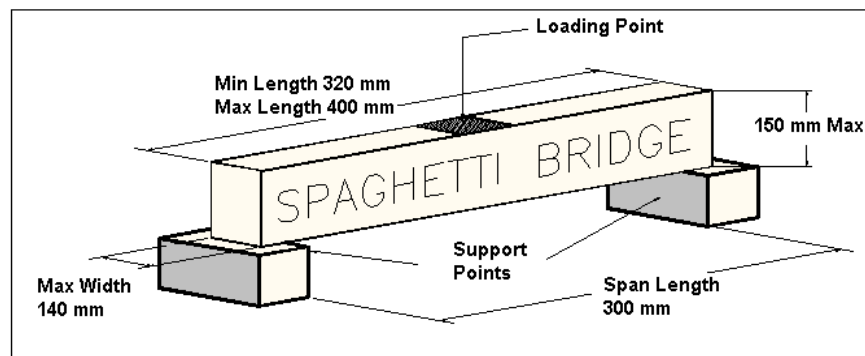
Objectives:

- To show creative power of brainstorming
- To work effectively with a team on a single task
- To work within limitations (weight and dimensions)
- To explore the use of different structural designs

Materials:

For each group of students, you will need:

1. Regular Spaghetti
2. White Glue
3. Access to a scale and ruler to ensure the structure weighs less than 350 grams and is within the specified dimensions (see sketch).



To test the bridges, you will need to:

1. Build your own test frame (instructions available) or;
2. Request that a Spaghetti Bridge Committee member come to your school with the load frame to test the bridges

(For more information, please email the APEGM office at apegm@apegm.mb.ca)

Procedures

1. Break the class into small groups and hand them their materials.
2. Tell the groups how much time they will have to design and build a bridge weighing less than 350 grams and within the dimensions specified in the sketch.
3. Take a picture of the bridge (optional).
4. When the glue is fully dry (1-2 days), load the bridges to failure.
5. Discuss with the class the different strategies they came up with. Ask them what ideas they had to abandon and which ones they went with and why. Compare the effectiveness of one bridge design over another (the

picture would be useful here if the bridge failed beyond recognition). Discuss any improvements or differences they would make if they were to repeat the exercise.

Optional Challenges

- Ask students to identify the internal forces acting on their structures (examples: compression, tension, shear, torsion). Ask them to predict the location and failure mode of their structure.
- Ask students to determine the efficiency of their structures by comparing its mass with the mass of the load it supports.

Safety Precautions and Hazards

- Bridge building can be messy. Students will need to wash the glue off their hands.
- During testing the spaghetti will break and possibly be scattered nearby. Students should be kept a safe distance from the load testing machine (2-3 meters). If the students wish to stand closer they must wear safety glasses.
- All hands should be kept far from the bridge during load testing.

Disposal Methods

Bridges can be either kept by their creator or thrown in the garbage.