

STEMify Low Ropes

Lava Island

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NGS Standards:

PS2 Motion and Stability
ESS3 Earth and Human Activity
ETS1 Engineering Design

Time:

Plan/design: 5-10 minutes
Activity/testing: 25-40 minutes
Group Processing: 5-7 minutes

Materials:

Lava Island element including
four boards (two per team)

STEM Themes:

Fulcrum and Leverage
Population Density
Counterweight, Pivot, and Load

Team Building Themes:

Planning
Patience
Perseverance
Cooperation

Permission:

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Activity Objective

The group will split into two equal teams and work to cross from the beginning platform to the final platform without their feet/bodies touching the ground. To accomplish this each team will be given two boards of the appropriate length. The boards may not be in contact with the ground when a person is traversing them. Once the participants reach the final platform, they will merge into one team again and must fit everyone on the platform without falling off.

Opening Inquiry

Lead the group in a discussion that will begin the planning/design stage of this challenge by asking a few guiding questions:

- ♦ What is the smartest way to securely get everyone on your team to the final platform?
- ♦ Are there any physical or emotional safety concerns you should factor in to your plan?

Set Up

Give the group 3-5 minutes to plan and design how they will successfully get each member of their group across the island hopping expedition.

Facilitator: listen covertly for themes you can draw out at the conclusion of the activity.



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Safety in Focus

The primary safety component of this activity is **no jumping**. Facilitators should ensure that the participants are never attempting to jump from one platform to the other, as this will certainly produce injury in some member of the group.

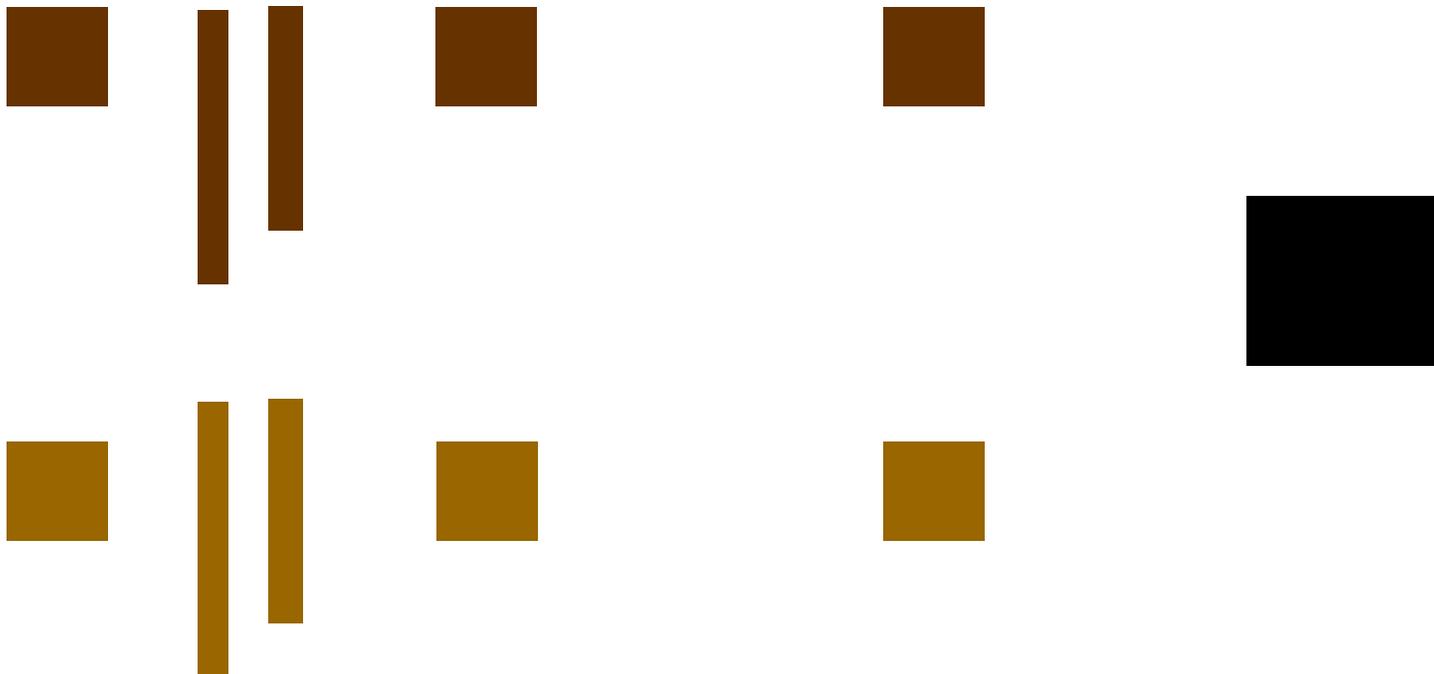
Other rules to share with the group related to safety:

- ◆ You may not stand on, ride on, be carried by, etc. another person at any time.
- ◆ You may not throw the boards at any time.
- ◆ There *will* be personal space issues with this activity. Be sure to consider those issues as you plan your strategy.
- ◆ If you are about to fall off, do not try to save it by jumping. (This is when many injuries occur.) No worries, I will just send you back to the start line.

Procedure Perfect

The perfect group will strategically consider the concept of counterweight. For this activity, that means they will have all of their strong/heavy persons permanently on the islands/platforms to provide the counterweight for the lighter individuals to cross. As far as the crossing goes, they simply must figure out that the two boards will rest on top of each other to form a bridge, counterweighted by a heavy person. Then the boards must be picked up and passed back and forth constantly. The best groups will do this without grumbling or growing weary.

The diagram below is a representation of a typical two-team Lava Island. If you are building one, make sure the platforms can fit exactly two people and that the two boards combine to be 1.33x the gap between the platforms.



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Facilitator Tips

Consider the following as the activity unfolds:

- ◆ Are there any safety concerns you need to immediately address?
- ◆ Is everyone maintaining involvement, at least through words of encouragement or support?
- ◆ What STEM words do you hear utilized by the group in their planning and testing?
- ◆ Does the level of challenge seem about right? Should an *Increasing the Challenge* be added?

Increasing the Challenge

1. Once a participant has made it to the final platform, they become mute.
2. When a participant falls off, add a mock injury to them the rest of the activity. Be sure to make them doable, or this will just breed resentment.
3. You, the facilitator, pick the teams at the beginning. Without drawing attention to their size/weight, put all of the physical extremes (heavy and light) on the same team and all of the moderates (medium sized) on the other team.

Variation

When time is not a concern, some group leaders will wish to have the entire group work on this together rather than splitting up into two semi-competitive teams. That is a reasonable request/variation, so long as the group is ten or less in number.

Processing the Activity

Spend 2-3 minutes discussing the following questions before moving on to the next activity:

- ◆ In what ways did your team work well together? What might you have done differently?
- ◆ What science and math skills did you use to complete this activity?

As appropriate, review the unmentioned/remaining *Themes* from page 1 to ensure group learning.

Citation

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Tanner, T., (2014). *STEMify Low Ropes: Lava Island* [Program of Studies]. Retrieved from the Ohio State University Extension website: <http://go.osu.edu/stemropes>

Date Created: February 2014

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Safety: The primary safety component of this activity is **no jumping**. Facilitators should ensure that the participants are never attempting to jump from one platform to the other, as this will certainly produce injury.

Other rules to share with the group related to safety:

- ◆ You may not stand on, ride on, be carried by, etc. another person at any time.
- ◆ You may not throw the boards at any time.
- ◆ There *will* be personal space issues with this activity, so consider those issues as you plan your strategy.
- ◆ If you are about to fall off, do not try to save it by jumping. I will just send you back to the beginning.

STEM Themes: Fulcrum and Leverage; Population Density; Counterweight, Pivot, and Load

Team Building Themes: Planning; Patience; Perseverance; Cooperation

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