

Nova Counselor Training Task 2

Lift Off!

Objective of the Training Task:

Give participants a CS STEM Activity to experience and analyze.

Objective of the CS STEM Activity:

Make and test a type 1 lever to discover where the fulcrum should be placed to give the user the most leverage. Apply the findings to the hypothetical outdoor situation of shifting a boulder with a makeshift lever.

Materials for Each Group:

- Pen (such as a fat dry-erase marker or magic marker)
- A strip of blue painter's tape (for taping down the pen to a table)
- Strong stick (maybe 12-18 inches long with blue painter's tape markings on one side as shown below.)



- Shoe box with about 2 lb of weight in it
- **Lift Off!** activity page – 4 copies so each participant can take one copy home.

Put the pen, the strip of tape, and the activity pages inside the box to facilitate handing out materials.

Procedure:

Divide participants into groups of 2-4.

Hand out a box and a stick to each group.

Explain the training objective.

Explain the activity.

Demonstrate the first lift.

Let everyone do the activity. Circulate to offer guidance as needed.

Questions to Ask Participants as Pretend Cub Scouts:

Which position of the fulcrum made it easiest to lift the load?

Was that position closest to the box or farthest from the box?

Do you know what to do if you encounter a boulder that you need to shift?

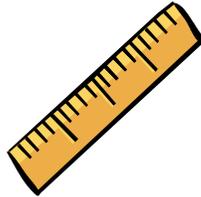
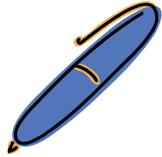
Questions to Participants as Future Nova Counselors:

Looking at the requirement for this Nova award, does it say how the boys are supposed to learn about levers?

Which would most boys pick, a hands-on experience or a lecture?

Lift Off!

Let's make a type 1 lever (like a see-saw) using a pen and a stick and use it to lift the edge of a heavy box.



Question: Where should the *fulcrum* be to make it easiest to lift the edge of the box?

Test: Tape the pen onto a table. The pen will be the fulcrum. We will lift the box 3 times.

Fulcrum at A. How hard is it to lift the box?

Fulcrum at B. How hard is it to lift the box?

Fulcrum at C. How hard is it to lift the box?

To shift a boulder in the outdoors, where should you place a rock to act as a fulcrum for a lever?

