

Engineering of Shelters (Design and Build) Grade 3-5

Belinda Gould¹

¹Affiliation not available

November 26, 2020

Lesson Objectives

- Scientifically examining how animals and humans build shelters to survive the elements.
- Learn how people survive when lost in the wild.
- How we can apply all these skills and see how we can help the homeless in extreme weather conditions.

Materials Needed:

- Different types of materials that would be great for keeping heat in as well as material that will help you stay cool (e.g. cotton, feathers, tin foil, fleece etc...)
- a pin
- magnet
- something to balance the pin (pin must be able to spin)
- different types of sticks (so that we can see which ones are best for kindling and why green pieces do not work as well).
- two different size of rocks
- paper and pencil for recording.
- water bottle
- hairdryer and ice
- digital thermometer
- 3D printer

Lesson Plan:

Using the 5 parts of STEAM we will exam the following ways of how we can solve our problem of surviving the wild to helping our homeless.

Day 1 Part A: (30mins)

Scientifically we start with looking at how animals have adapted to harsh weather. How they can survive in the arctic or in the desert. What are some of the unique ways they survive? Research how we as humans have studied animals to develop ways for us to survive in hot summers and cold winters. Allow the children to discuss what they think will work and research online to see what other scientist have found about animals and how they adapt.

Day 1 Part B: (20mins)

Start to experiment with the different types of materials to see which ones would work best for heat retention and heat loss. You can use a water bottle that is at room temperature. The goal is for the children to see what materials retain heat the best when wrapped around the water bottle does the temperature stay the same or get hotter or cooler when we use the hair dryer and when we place the bottle in ice.

Day 2 Part A: (15 mins)

Show a video on survival shelters like: <https://youtu.be/tzUpH0Zft5c>

Allow the children to discuss why these types of shelters would work. Challenge the children to write down how they would start a fire or build a compass. What other ways can they stay safe if they were ever lost in the wild?

Day 2 Part B: (30mins)

Using the skills we know start to design ways we could help the homeless stay warm without big bulky things to carry. As we know most homeless people are limited to how they can keep their personal items. Using what we know about shelters, animals and survival how can we design a unique item that could help the homeless. A good example is to show the youtube video of a lady who designed portable sleeping bags that double as a jacket. Here is the link: https://youtu.be/6va0_GPBAZA

Day 3:

This would be the final day where the children would get to explore TinkerCad and design their prototypes to present to the rest of the class how it works and how it could help the homeless (after it is printed from the 3D printer).