

## TEACHERS TRAIL GUIDES

### Trail Guide Build-A-Bike A: 3.1 Heating & Cooling

#### Visit the Sports Gallery

#### Build-A-Bike

**Build a bike for your chosen rider. What properties of the materials did you consider as you constructed the bike for this rider's preferences?**

#### *Teacher Notes:*

*Student responses should consider the size of each part, as well as the materials' strength, flexibility, weight, its ability to be formed into the required shape (malleability).*

Trail Guide Build-A-Bike B: 3.1 Heating & Cooling

**Visit the Sports Gallery**

**Build-A-Bike**

**Examine two versions of the same bicycle part.**

**How are the materials used for these parts the same?**

**How are they different?**

*Teacher Notes:*

*Student responses should consider the materials' strength, flexibility, weight, its ability to be formed into the required shape (malleability).*

Trail Guide Apollo Mission Spacesuit: 3.1 Heating & Cooling

Visit the **Exploring Space Gallery**

**Apollo Mission Spacesuit**

Look at the replica spacesuit from the Apollo missions.

Do you think the material used to make the spacesuits is different than your clothes?

Why?

Was the mass of the suit an important factor in its design?

Would this suit be useful on Earth, why or why not?

*Teacher Notes:*

*Student responses should focus on the differences in temperature and gravity on the moon. Because the moon is so much colder than Earth, insulation was vital to the Astronauts survival on these missions. Because the gravity on the moon is 1/6<sup>th</sup> the gravity on Earth, the suits mass wasn't as important a factor. On Earth the mass of the suit would cause it to be too heavy for any practical use.*

## Trail Guide What Is Insulation: 3.1 Heating & Cooling

Visit the **Smart City Gallery**

### **What Is Insulation**

Study the different types of insulation that are displayed.

Which type of insulation would be best for your house?

Why is it important to have proper insulation?

How would your energy costs be affected without insulation?

### *Teacher Notes*

*Students should notice that without insulation it would be much more difficult to stay warm in the winter. It would also cause the families energy costs to rise, as more energy would be needed for heating the house and the hot water tank. Student responses for the best choice will depend on the cost of the different insulations.*

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