

Scrapyard Scraps Session plan/ideas

<https://primarylibrary.crestawards.org/all-star-challenges/61746949/44>

In this activity, children will think about which materials are good insulators by measuring the temperature of model 'mice' wrapped in different materials.

Plan

1. Introduce the activity by reading out the story on the activity card.
2. Ask the children what they think they'll be investigating based on the story.
3. Ask what materials help to keep them or things that they use warm and discuss how they could investigate which materials are good insulators.
4. Explain that in today's activity they will be using plastic pots with warm water inside to represent a mouse. Demonstrate how to take the temperature of the water using the digital thermometer. Explain that we are looking to see how quickly or slowly the mouse loses heat, so we will take a measurement at the beginning and after ~5 minutes.
 - a. What do children expect will happen to the numbers on the thermometer?
 - b. How will we know if the material helps to keep the mouse warm?
5. Ask children to pick one pot to investigate and take the lid off.
6. Explain how to fill out the worksheet.
7. Fill up each open pot with hot water (~40 degrees) and screw on the lid.
8. Record the start temperature of the water (allow time for it to level off).
9. Ask children to watch what the numbers do and discuss with others on their table. After 5 minutes ask everyone to record the final temperature.
10. Ask children to share and write the results that other people have found.
11. As a class go through how to subtract the final temp from the start temp.
12. Explain that a big difference means the mouse lost lots of heat compared to a small number which means the mouse stayed warm.
13. Ask children to highlight the material that resulted in the smallest number.
14. Survey the class for the material that lost the least heat and discuss why the different materials are good/bad insulators.

See next page.

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15. Suggest/discuss occupations and situations that might require the skills/knowledge they've developed e.g. https://nustem.uk/careers_resource/materials-engineer/

19. Discuss related activities they could do (at home). Give out take-home sheets.

20. Give out stickers/stamps for their passport.

Tips and safety

- Check the temperature of the water is not too hot before filling the pots.
- Remind children to check if their thermometer display is upside down.
- Remind children to push the metal sensor end of the thermometer down so that it is submerged into the water and to keep it there for the whole duration.

Additional ideas/extension/home activities

- Use the display board with test tubes wrapped in different materials to test some extra materials to discuss.
- Consider other relevant properties of materials - should they be soft and/or waterproof?
- Find out what animals use to keep warm. Do all animals gather scraps?
- Take a look at these activity ideas on the topic of materials and their uses: <https://www.stem.org.uk/resources/community/collection/467538/learning-home-week-6-materials-and-their-uses>

Scrapyard Scraps

Today we are thinking about **INSULATION**

What is the best material for the mouse to make its nest from?

The mouse needs to keep warm.



Material	Starting temperature (°C)	Final temperature (°C)	Temperature drop (°C)
Nothing			
Bubble wrap			
Newspaper			
Metal foil			
Felt			

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Which material did you find was the BEST at keeping the mouse warm?

Which material did you find was the WORST at keeping the mouse warm?

What materials do YOU use to keep warm?