
ST. JOHNS
CONTROL

# St John's TEDS Day
# Together Everyone Doing Science

## Space Mission - Building the ultimate Space colony

Thursday 7th November 2024

# The Great Space Mission – Building the Ultimate Space Colony!

**St John's Space Research Teams.**
**We need your help!**
**We think we have found a new habitable planet and we need you to help us test different materials so that we can try to build a new colony.**
**Are you able to help us?**

Research Teams are you ready to help the astronauts set off on their pioneering journey ?

# Which type of enquiry will your class use?

# EYFS Research Team

**Challenge:**

"Which material will make the astronauts' bed comfortable and cosy?"

# Year 1 Research Team

**Challenge:**

"Which material makes the best space suit for protection against space rain?"

# Hedgehog Research Team

**Challenge:** "Which material is strong enough to build a bridge over the space craters and riverbeds?"

Otters Research Team

**Challenge:** "Which type of rock will be the best  to build strong space mission base on the planet and why? "

# Owl Research Team

**Challenge: "Which materials should we use for the space windows so we can see the stars?"**

# Fox Research Team

**Challenge:** "Which material will keep the astronauts' drinks warm during the freezing space nights?"

# Hawk Research Team

**Challenge:** "Which size of wheel will help the astronauts' rovers move smoothly over different surfaces?"


# Welcome back to SJS Mission Control

# What did we find out?

Which of these enquiry types did you use in your science investigations today?

Which skills did you use?

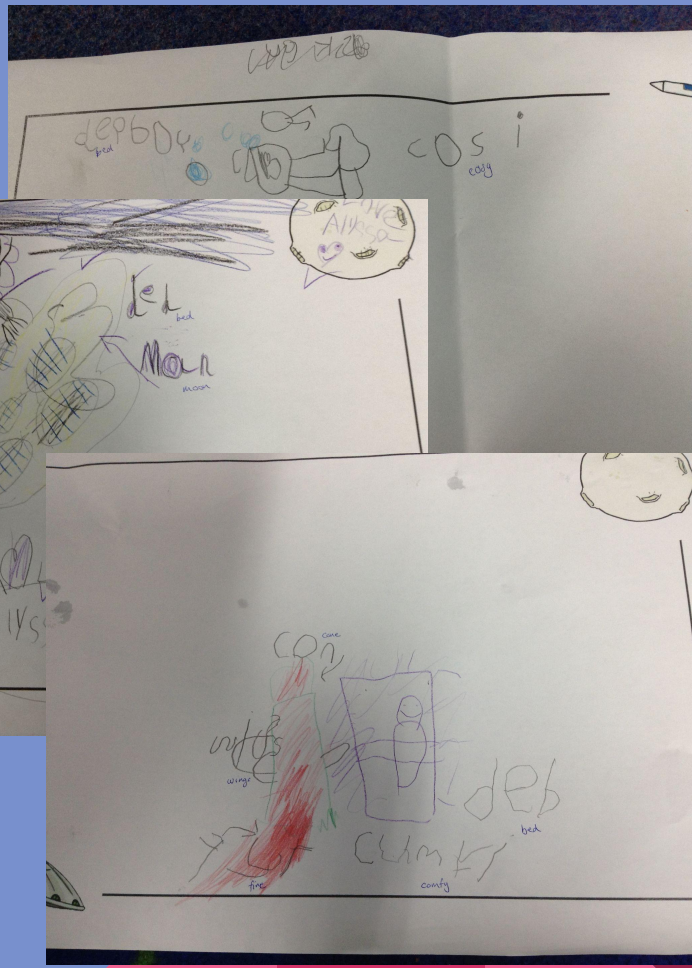
asking questions ☐ making predictions ☐ setting up tests ☐ evaluating ☐

observing and measuring recording data ☐ interpreting and communicating results ☐

# Reception :

We watched a video of an astronaut sleeping in space and found out that they sleep standing up because there is no gravity! We tested different materials and found that some were too itchy, too rustly, too hard, too thin, too cold - the sleeping bag was just right! It was warm, soft, thick and comfortable.

We also designed space bedrooms, made rockets and turned ourselves into astronauts!



# Year 1:

We  tested if materials were waterproof by pouring water over them.
We found that only the plastic apron , foil and foil wrap were waterproof!

We decided that the foil wrap would be most suitable because it is waterproof and thick so it is warm.

# Year 2 :

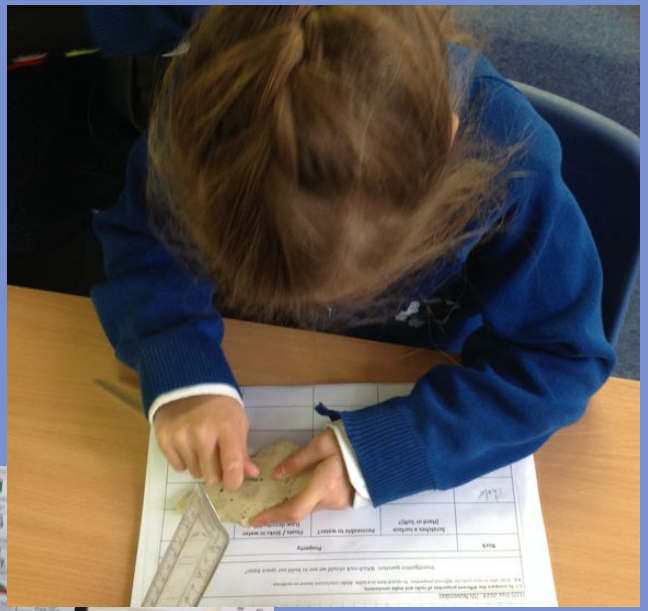
We tested different materials to see which would be the strongest for bridges in space. We did let the materials bend a lot, but we did not test our bridges to destruction as we thought this would not be safe!

The paper couldn't even hold 50g, but when we folded it, the paper bridge became stronger!

The metal bridge was the strongest bridge, but we were all felt a bit scared at how much it was bending after adding 2800g to the middle of the bridge!

# Year 3 :

We tested different rocks on their durability, permeability, density and appearance of crystals.



# Year 3

Conclusion

- Granite was a harder rock and chalk was a softer rock.
- The rocks that let water through and were permeable were chalk and limestone.
- No rocks floated so they all had a high density.
- Granite and marble had crystals present.

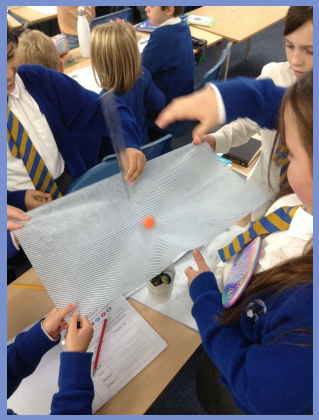
We concluded that we should build the base out of either **marble or granite**, as they are durable, impermeable and had a high density.

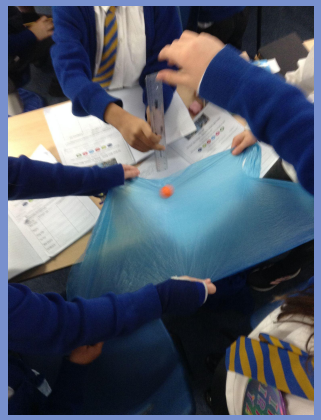
# Year 4 :

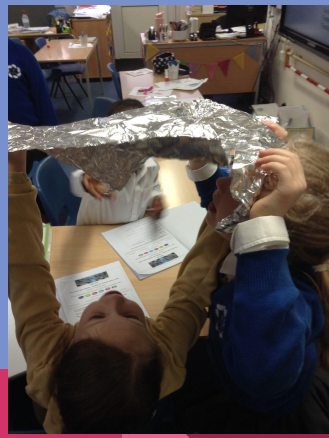
After discussing what qualities a window in our spaceship would need we decided to conduct two tests on our materials.

1. Strength test: Does the material protect us from impact? We dropped a small ball from 30 cm above each material and observed whether it bent, broke or withstood the impact.
2. Transparency test: Can we see the stars through the window? We held each material up to the light and tested whether we could see it. We decided whether the material was transparent, translucent or opaque.

We tested cardboard, plastic, tin foil, cling film, a blue cloth and some blue plastic.

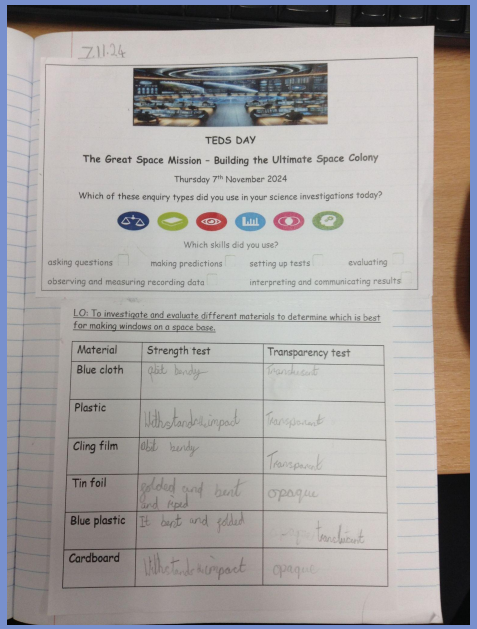






# Year 4 results:

We concluded that plastic would be the best material for the space windows because it was transparent and strong.



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TEDS DAY

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Which of these enquiry types did you use in your science investigations today?

Which skills did you use?

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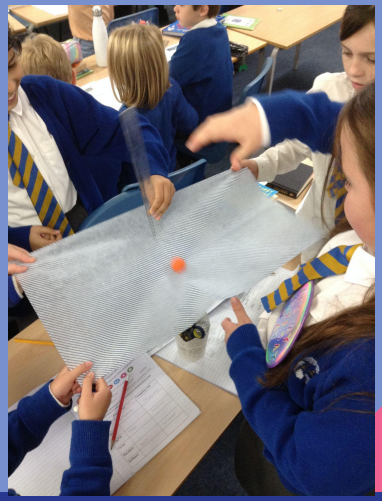
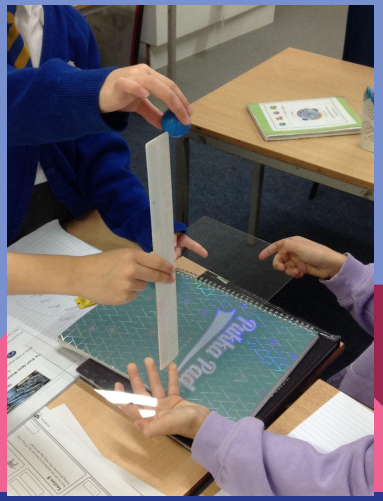
LO: To investigate and evaluate different materials to determine which is best for making windows on a space base.

| Material | Strength test | Transparency test |
|---|---|---|
| Blue cloth | Not bendy | translucent |
| Plastic | Withstands impact | Transparent |
| Cling film | Not bendy | Transparent |
| Tin foil | folded and bent and ripped | opaque |
| Blue plastic | It bent and folded | translucent |
| Cardboard | Withstands impact | opaque |

Conclusion :

We found that the best material was plastic because you could see trough it clearly and it was verrry strong and the worst one was tin foil because it riped and you couldn't see through it and the one in the middle was blue plastic because you couldn't see trough it.



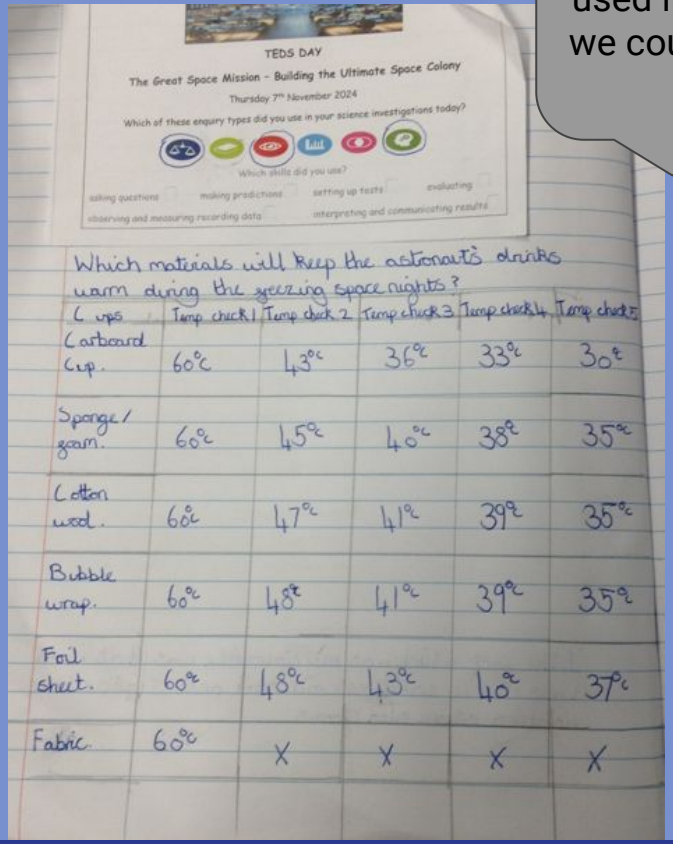


# "Which material will keep the astronauts' drinks warm during the freezing space nights?"

We wrapped the cups in different materials . We use thermometers to test the water over time .

# Year 5 results:

We presented our data in a table and then we used line graphs so that we could see our results clearly.



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Which of these enquiry types did you use in your science investigations today?

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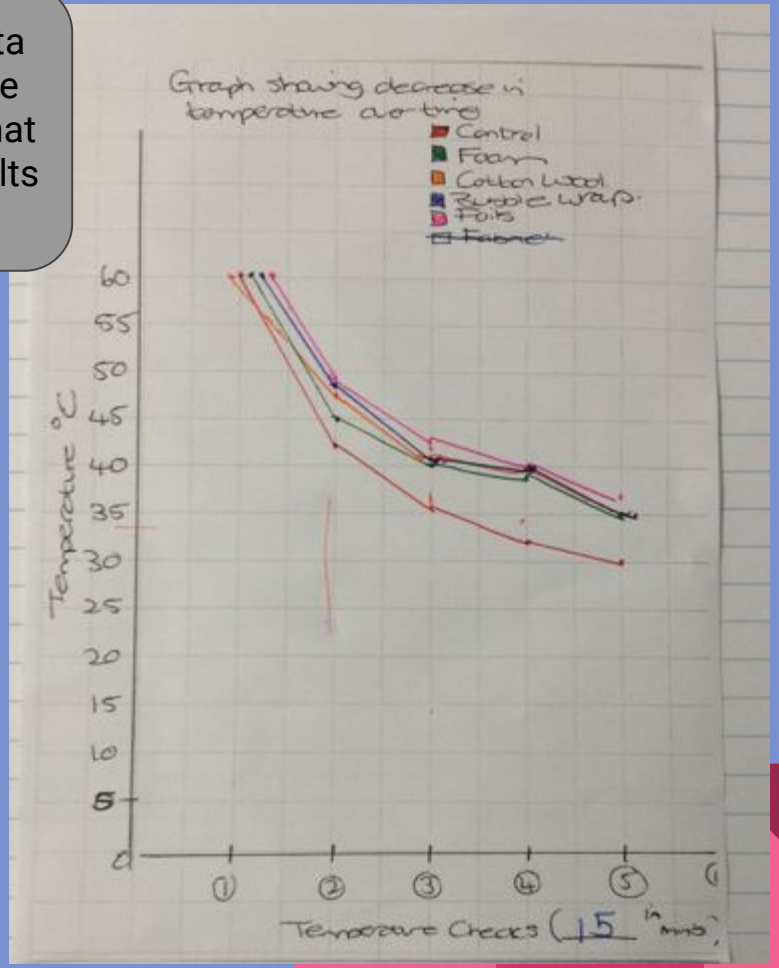
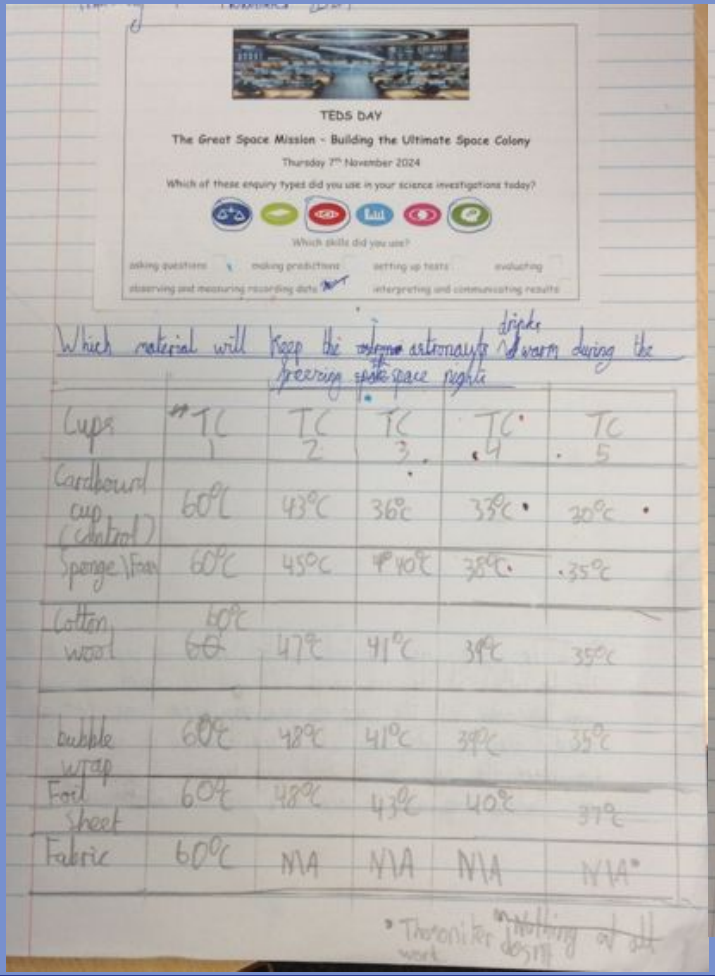
Which materials will keep the astronauts drinks warm during the freezing space nights?

| Cups | Temp check 1 | Temp check 2 | Temp check 3 | Temp check 4 | Temp check 5 |
|---|---|---|---|---|---|
| Cardboard Cup. | 60°C | 43°C | 36°C | 33°C | 30°C |
| Sponge/ foam. | 60°C | 45°C | 40°C | 38°C | 35°C |
| Cotton wool. | 60°C | 47°C | 41°C | 39°C | 35°C |
| Bubble wrap. | 60°C | 48°C | 41°C | 39°C | 35°C |
| Foil sheet. | 60°C | 48°C | 43°C | 40°C | 37°C |
| Fabric | 60°C | X | X | X | X |





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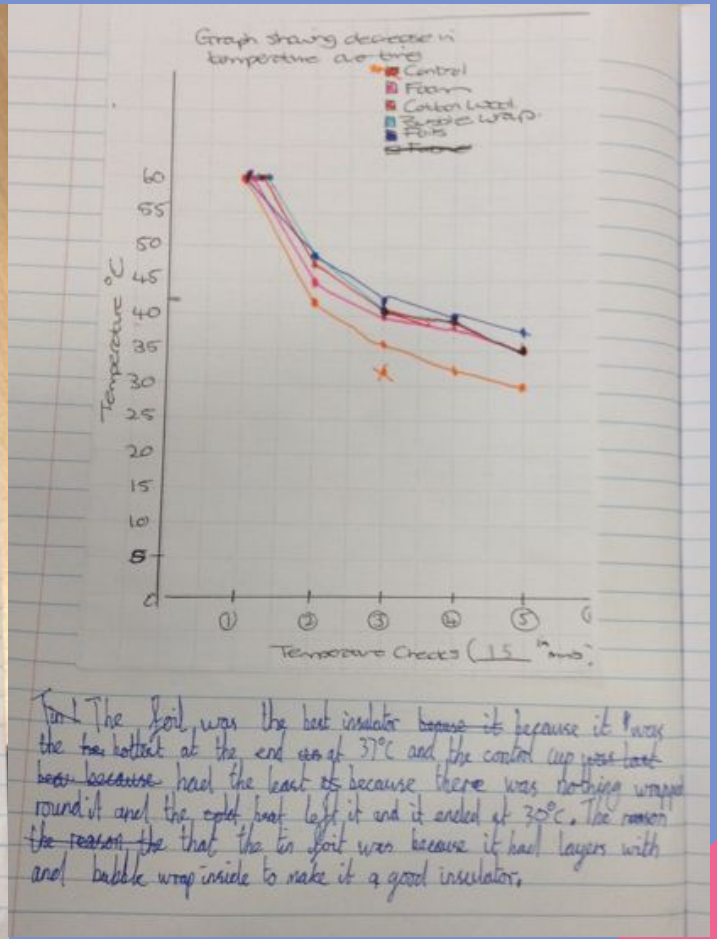
Which material will keep the astronauts drink warm during the freezing outer space nights

| Cups | TC 1 | TC 2 | TC 3 | TC 4 | TC 5 |
|---|---|---|---|---|---|
| Cardboard cup (control) | 60°C | 43°C | 36°C | 35°C | 30°C |
| Sponge/Foam | 60°C | 45°C | 40°C | 38°C | 35°C |
| Cotton wool | 60°C | 47°C | 41°C | 39°C | 35°C |
| Bubble wrap | 60°C | 48°C | 41°C | 39°C | 35°C |
| Foil Sheet | 60°C | 48°C | 43°C | 40°C | 37°C |
| Fabric | 60°C | N/A | N/A | N/A | N/A* |

*Thermister [illegible] not work




Foil The foil was the best insulator because it was the hottest at the end at 37°C and the control cup was because had the least as because there was nothing wrapped round it and the cold heat left it and it ended at 30°C. The reason the reason the that the tin foil was because it had layers with and bubble wrap inside to make it a good insulator.

We found out that the tinfoil sheet was the best insulator as the temperature remained hot over a longer time. It was a special sheet with layers of bubble wrap in between. We know that bubble wrap is a great thermal insulators.

We think the astronauts need to use a good thermal insulator to keep their drinks hot. They could use foil insulation or bubble wrap  as these are good insulators.

# Year 6 Hawks

"Which size of wheel will help the astronauts' rovers move smoothly over different surfaces?"




We put different materials in a tray to replicate the surface of Mars, like small stones, large stones, salt and earth and then tested different cars to see which size wheel would travel better over the surfaces.

# Year 6 Hawks

"Which size of wheel will help the astronauts' rovers move smoothly over different surfaces?"

| | Small wheels | Big Wheels |
|---|---|---|
| Salt | X | / |
| Moon dust | X | / |
| Big stones | X | / |
| Small stones | X | / |
| Medium stones | X | / |

We found that on all of the surfaces that we tested, the car with the bigger wheels travelled better over each terrain.

Max will explain why he thinks this is…….

# Thank you St John's Space Researchers!

BREAKING NEWS !!!!!


Will you and your family members take on the new St John's STEMquest Challenge?

**Challenge #1**

# Lunar Lander Challenge

NASA needs your help to design a spacecraft that will keep the astronauts safe when landing on the moon! How can we soften the landing of the spacecraft to protect the astronauts when landing?