

JPT/Hi Draft List of Activities:

Expedition activity - menu sheets and instructions (Cafe
Antarctique menu for Olivier?)
Polar snacks - calculations linked
SEE EXPEDITION FOOD FOLDER

6 Activities:

Teams to be given 1st and 2nd choice in advance (provide
some information for them)

Submersibles and ocean grabber (lemonade bottles - coke
bottles from home)

Ocean chemistry (JPT gets fizzy drinks)

Food chains/animals/adaptations/penguin huddling/blubber
gloves (Holly will get gloves and blubber, lots of ice)

Tents and materials - modelling straws, materials, weights?
(Holly has some)

Ocean circulation and climate (Holly will make coloured ice)

Boats - drip tray, Mary Rose boxes, sailing vs power challenge

Draft Programme:

9-9:15 Thameside arrive at Caldecott

9:15 JPT introduces Antarctic Science

9:25 Al Sylvester introduces Antarctic
Exploration

9:35 Team building - calculate food and
clothing requirements for a day in
Antarctica (including Antarctic menu for
judging by Olivier Hubert)

10:00 Break with Antarctic snacks

10:20 Training begins - teams (2 from
each school) learn the basic activities in
6 locations (support from school
staff/ATOM/ASP/Science Ambassadors)

11:15ish review progress - teams begin
designing displays

12:15 lunch - Thameside return to
school with some supporting staff and
Al Sylvester

1:00(?) Teams work on setting up and
rehearsing displays

2:45ish Olivier Hubert arrives Caldecott

3pm BOTH schools - introductory talks
by either Al or Olivier; parents visit

Submersibles and ocean grabbers (1)

Instructions for making Cartesian Divers:

1. Cut a pipette tube off at the first mark below the bulb
2. Fill a plastic drink bottle right to the top and place it in a tray or bowl
3. Stick a small lump of plasticine to the pipette stump
4. Place the diver in the mouth of the bottle and adjust the amount of plasticine until the bulb is JUST below the water level
5. Top the bottle up right to the top and screw the lid on very tightly
6. Squeeze and enjoy!

Resources

2L plastic bottles

Tray or bowl

Plastic pipettes

Plasticine



Submersibles and ocean grabbers (2)

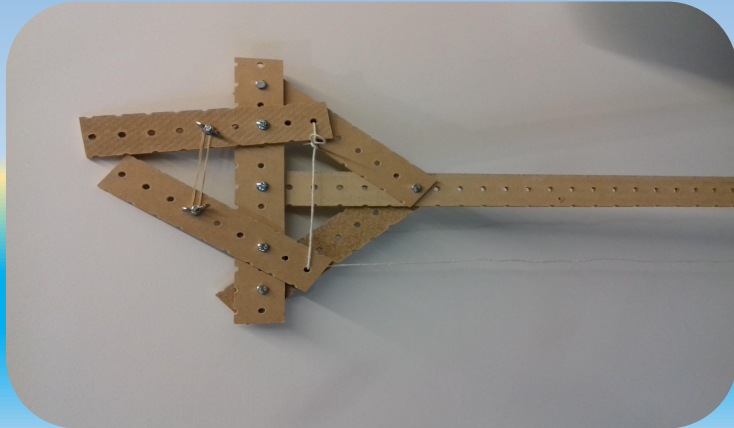
Instructions for making grabber arms:

1. Study the photo of a suggested design
2. Try to copy this design using the materials provided
3. Make a sea creature new to science and try to capture it with your grabber
4. Evaluate and improve your design

Resources

Ocean grabber kits/robot arms

Craft materials for sea creatures, including tape, glue, bobbles, googly eyes, pipe cleaners etc



Polar research ships



Resources

1. Put the simple model ship in a bowl of water and add weight until it sinks - how much did it hold?
2. Put a deck on the ship and add weight on the deck - what happens now?
3. Your challenge is to make your model ship
 - a. buoyant and stable
 - b. able to carry weight on deck and in the hold
 - c. able to cross an icy sea powered by the wind

1. Ship stability kits with sails
2. 100g masses
3. Bowls
4. Long test tray
5. Fan
6. Corrugated sheets - cutting tools and duct tape
7. ICE



Acid in the oceans

1. Blow GENTLY for about a minute into a test tube one quarter full of universal indicator (what gas do you breathe out?)
2. Look at the indicator colour and compare to the chart (what type of solution does the gas make - acid or alkali?)
3. Put still mineral water in one glass and fizzy in another. Add a bit of indicator. What do you see?
4. Put some sea shells in a beaker and add acidic vinegar. Put the full beaker on some scales and weigh it. Weigh it again every minute and record your results . What happened to the shells in an acid?

Resources

Safety glasses

Still and fizzy water

Shot glasses

Indicator and charts

Clear vinegar

Recording sheets

Shells

Scales

Straws

Plastic test tubes

Marine food chain charts



Antarctic animal adaptations

1. Make a model of an Antarctic food chain - from the algae at the bottom to the apex predators at the top
2. Set up an investigation to show that penguins in the middle of a huddle stay warmer than the ones at the edge
3. How long can you keep a bare hand in ice compared to one inside a blubber glove?



Resources

Antarctic animals

Model plankton

Plankton images

Pond algae

Penguin test tube racks

Gratnell trays

Large, plastic beakers (to fill test tubes)

Thermometers

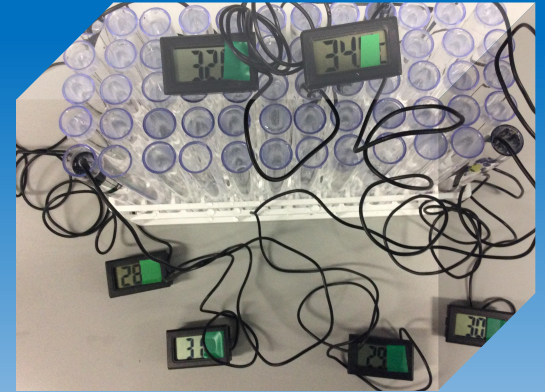
Stop clocks

Recording sheets

Bowls, ice, margarine, washing up gloves

Non-latex disposable gloves

ICE



The Southern Ocean (1 - Heating and cooling)

1. Fill the water tank three quarters full with cold tap water
2. Float a few ice cubes gently on the top - what happens as the ice melts?
3. Get some water from a hot tap and add red food colouring to it
4. Dribble the hot water gently down the side of the tank - use a funnel to help. Can you make a warm, red layer at the top?
5. Explain why all the deepest water in the oceans comes from the polar seas

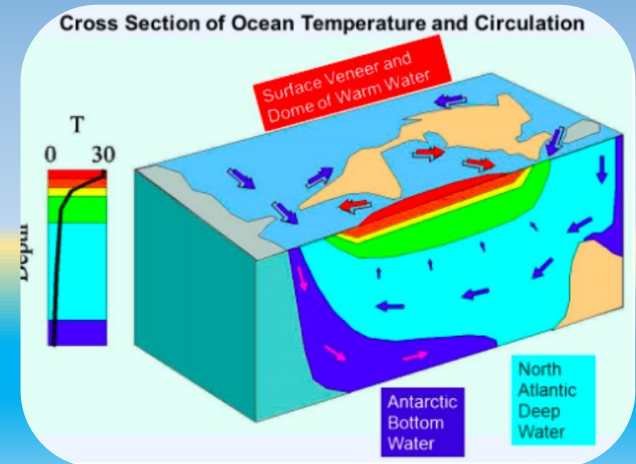
Resources

Water tank

Blue ice cubes

Red food colouring

Funnel



The Southern Ocean (2 - Sea ice, glaciers and ice sheets) **NEW METHOD - model landscape**

Resources

1. Fill a beaker to 150ml with cold tap water. Add two or three ice cubes and mark the new level - does this level change as the ice melts?
2. Now hold a funnel with two or three ice cubes in over the beaker of water. Now what happens to the water level as the ice melts?
3. Explain why melting glaciers and ice sheets make sea level rise but melting sea ice doesn't

Plastic beakers

Base tray

Model landscape

Sharpies

Ice cubes

https://www.esa.int/Education/Teachers_Corner/The_ice_is_melting_How_can_we_investigate_the_effects_of_melting_ice_Teach_with_space_PR13?fbclid=IwAR2RkvKPqeHI2XywUz7JEmfUnZ1quwxoy7LSggOZDR6tOL196Xw4AvzxOuM



Why is Antarctica cold?

Shine a torch at a big angle and a small angle onto a sheet of graph paper - trace out the size of the light spot, what happens as the angle changes?

Use the sun tubes and inflatable Earths to show how energy from the Sun is more spread out in the polar regions than at the equator

Use the globe and inflatable Earths to show why the Earth has seasons

Shine the lamps onto different coloured surfaces in the box and use infra red thermometers to find the temperatures

Resources

Inflatable Earths

School globe

Sun Tubes

Torches

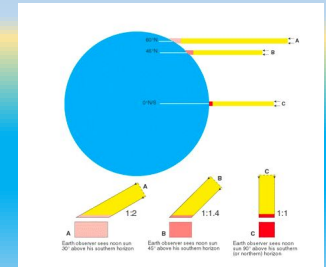
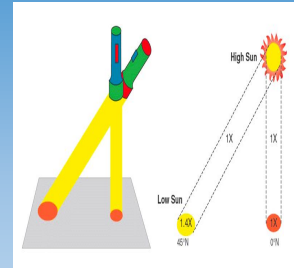
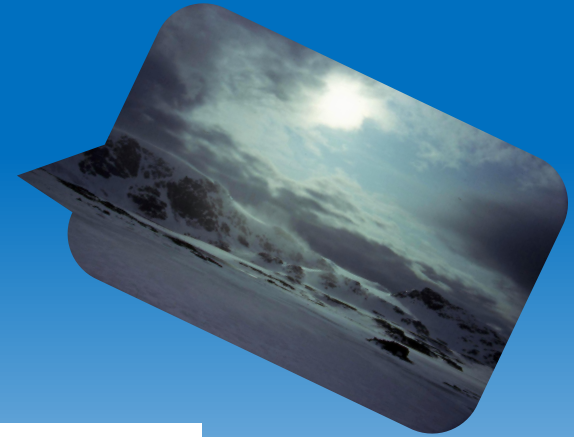
Graph paper

Lamp

IR thermometers

Black and white paper

Box lid, cling film



Living in Antarctica - tents and clothes

Build model tents in different shapes and materials

Test how much weight they can hold

Which shape is best for holding up lots of snow?

Which shape stands up best in the wind?

Test the 'layer principle' - which pot stays the warmest - no layers, 1 layer, 2 layers, 3 layers of felt around a plastic pot of warm water

<https://www.youtube.com/watch?v=kcdS7C3ILiM&feature=youtu.be>

Resources

Trays/bases

Dowel

Masking tape, String

Materials

Weights/coins/blocks?

Tent shape pictures

Pots

Digital thermometers

Cut felt+elastic bands

Stop clocks

Recording sheets

Fans

