



Science

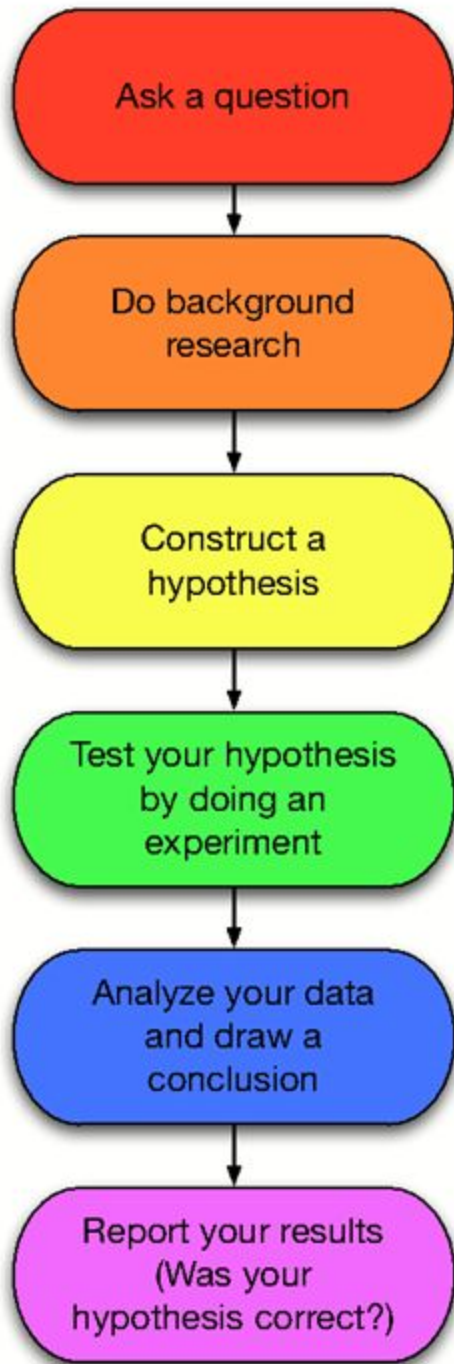
SCIENCE

TRANSITION TASKS

Science is a method...

- The world used to be quite a different place.
- People lived in fear of disease and hunger and struggled against the whims of the natural world.
- Thinking scientifically has changed that relationship.
- These next few tasks are to help you develop an understanding of that journey and some of the necessary skills.

The Scientific Method



Scientific Method

- **Defined**: Series of steps to collect information or solve problems
- 1) Observation
 - 2) Hypothesis
 - 3) Experimentation
 - 4) Data Analysis
 - 5) Conclusion

TASK: SKILLS PRACTICALS

This can only be done if you have the equipment in your kitchen etc. If you can't do all of it, don't worry.

- Scientists need to be able to measure accurately and precisely (these are different things!).
- You are going to do a simple experiment that involves different **VARIABLES**.
- Variables are things that can change in an experiment, be measured or have to be kept the same to make sure we can tell what is happening.

Dissolving salt:

- While it might seem a dull idea, there is actually a lot of science to be explored in dissolving salt.
- You can measure the **MASS** in grams.
- The water **TEMPERATURE** in degrees celsius.
- The water **VOLUME** in millilitres.
- The **TIME** taken in seconds.

FOCUS ON SAFETY:

Safety Information

Spills – risk of slips

Mop up immediately, keep work area tidy

Glassware – risk of cuts if broken.

Apply pressure to wounds and inform teacher immediately.



- **PLEASE ALSO TAKE CARE WITH HOT LIQUIDS TO AVOID SCALDS AND BURNS.**

2: Does the Temperature of Water Affect the Speed of Dissolving?



- Measure out three equal amounts of sugar. Make sure the sugar is the same type (e.g. caster). Weigh it if you can to get an equal mass.
- Heat up some water in a kettle.
- Fill three glasses/tea mugs with different mixes of tap and kettle water to create three different temperatures.
- Add the sugar samples to the different volumes of water and time which one takes the longest to dissolve.

EQUIPMENT:

TIMER
GLASSES / MUGS
KETTLE
WATER
SUGAR
SPOON
THERMOMETER
SCALES (OPTIONAL)

Independent variable	Dependent variable	Controlled variables
What you change.	What you measure.	All the other possible things you can change.

2: Does it dissolve?

Test a range of substances to see if they dissolve in water:

Equipment:

- ~~Beaker~~ mug
- ~~Stirring rod~~ spoon
- Teaspoon
- Timer
- Hot water (kettle)
- Bucket and sieve (for disposal)

• A range of substances to test:

- salt
- sugar
- flour
- chalk
- sand
- fruit cordial
- coffee
- pepper
- glass paint
- jelly cube

Method:

Step 1: Half fill the beaker with hot water.

Step 2: Add 1 spoonful of the substance you are testing and stir for 3 minutes.

Step 3: Observe the solution carefully. Can you see any of the substance remaining? Is the solution transparent (see-through)?

Step 4: Record your observations into the table.

Step 5: Empty and rinse your beaker through the sieve and into the bucket.

Step 6: Repeat steps 1 to 4 for all remaining substances.

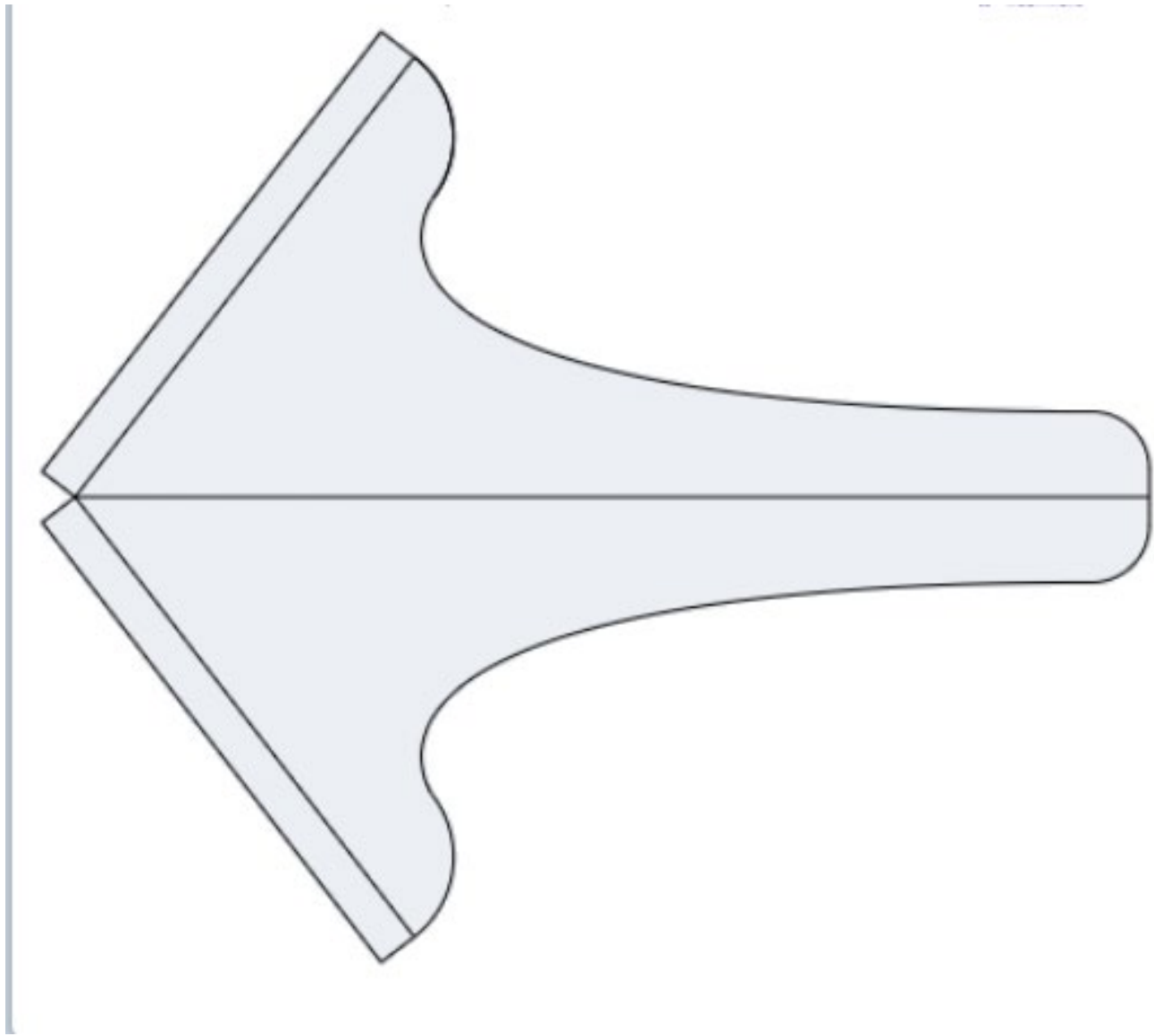
Substance/solute	Prediction	Observations	Result
	Will it dissolve? Y or N	What does the solution look like?	Did it dissolve? Y or N
salt			
sugar			
flour			
chalk			
sand			
fruit cordial			
coffee			
pepper			
gloss paint			
jelly cube			

TASK: Making a Sundial

Needs: scissors, card, printout, glue

- Print out the sundial paste the dial face onto thin cardboard, such as from an old cereal box.
- Fold the gnomon in half and paste it together. Be careful to first fold the bottom tabs outward.
- Once the gnomon is folded and glued, apply glue to the tabs and stick the gnomon onto the base. Make sure that the gnomon high end face toward noon (XII) on the dial base.
- **Extension: Research onto ancient timekeeping and clocks. How did they do it before Casio?**





TASK: A photo timeline of discovery:

NEEDS: camera, PPT/word or photo app.

There have been some significant leaps in our technology over the centuries.

- Fire
- Animal skin clothing
- Discovery of metals (copper and bronze)
- Cultivating cereals
- Medicine
- Electricity etc

Create a visual representation of this journey (adding any important milestone discoveries / inventions that you consider worthy).

e.g. Take pictures of stuff around the home, such as a candle or a lit match.

NOTE: PLEASE TAKE CARE IF USING ANYTHING DANGEROUS, SUCH AS FIRE!

ALSO: Please don't take any identifiable photographs of people or precious objects **(BE E-SAFE!)**

TASK: Research Project

NEEDS: Internet or encyclopaedia

- The history of scientific discovery has many standout heroes: Galileo, Newton, Einstein.
- Try to find out about a scientist who you think changed the world. This could be the person who invented vaccines, refrigeration, electricity etc. **YOUR CHOICE!**
- I would like you to write a short piece about them. **Who, what, when, where, why and how?** Try to look up more than one website / book as a **reference** and write down where you go your information from at the end (cut and paste the website etc).
- Can you decide if the source you have used is reliable? Are there better sources? Remember, not everything on the internet is true! Check your facts!

Hooke's Law Practical

- Measuring the strain on a material.
- Place a marshmallow in a wide glass. Place a plastic cup on top.
- Using a ruler measure the width of the marshmallow.
- Add a known volume of water to the disposable cup. $1\text{ml} = 1\text{g}$.
- Adding the water will compress the marshmallow.



compression of the
marshmallow (mm)

Sketch out your results to
see if there is a
relationship between
mass added and the
compression.

mass of the water in g