

Introducing Science Process Skills



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Scientific skills

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graph TD; A[Scientific skills] --> B[Science process skills]; A --> C[Manipulative skills];
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Science process
skills

Manipulative
skills

How many SPS are there? In your country?



Science Process Skills

1. Observing.
2. Classifying
3. Measuring and using numbers.
4. Inferring.
5. Predicting.
6. Communicating.
7. Using space/time relationship.
8. Interpreting data.
9. Defining operationally.
10. Identifying variables.
11. Hypothesising.
12. Experimenting.

Scientific skills

SCIENCE PROCESS SKILLS

Observing
Classifying
Measuring & Using Numbers
Making Inferences
Predicting
Communicating

BASIC

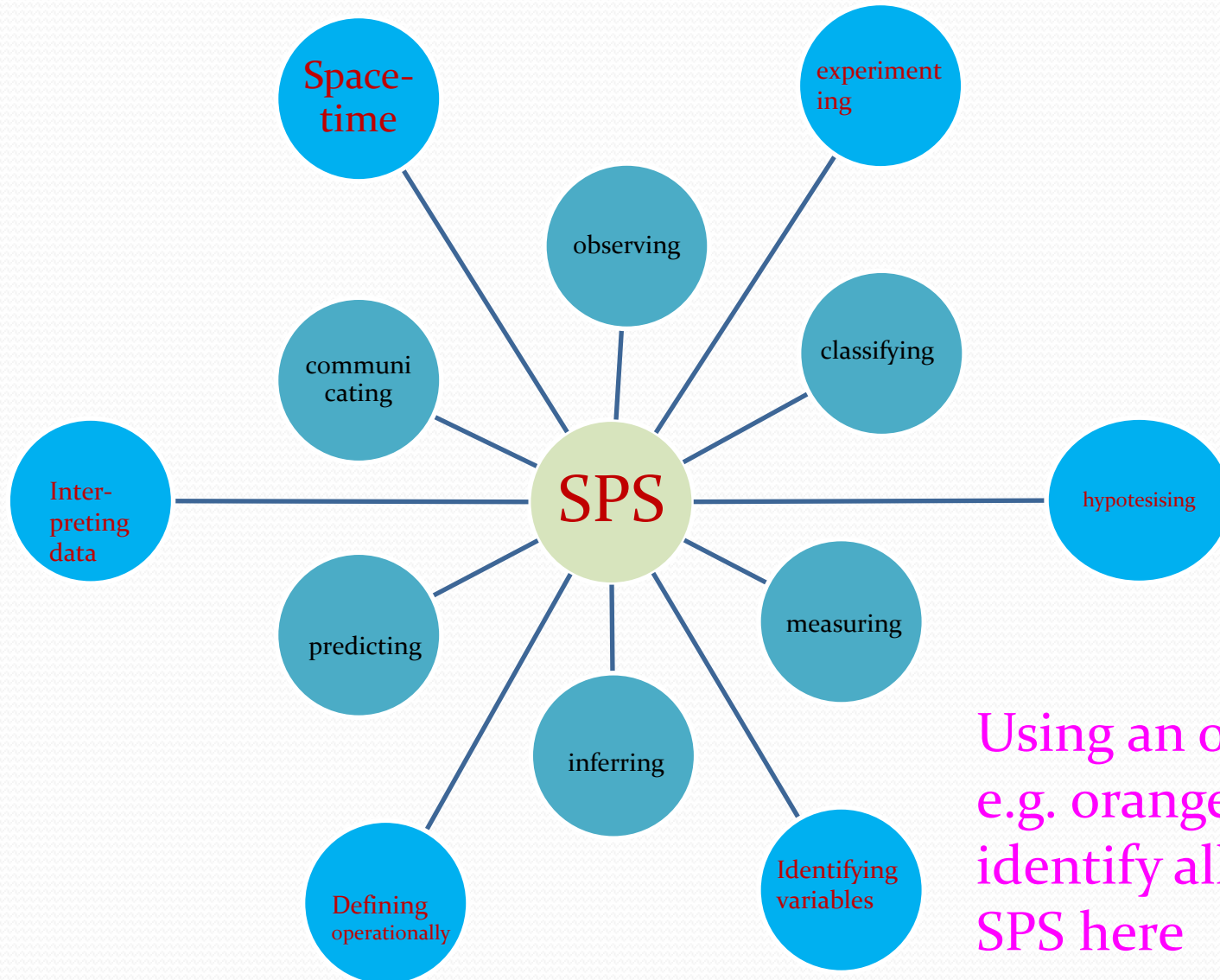
Space-time Relationship
Interpreting Data
Defining Operationally
Identifying Variables
Making Hypotheses
Experimenting

INTEGRATED

MANIPULATIVE SKILLS

Use & handle science apparatus & substance
Handle specimen correctly & carefully
Draw specimen & apparatus
Clean science apparatus
Store science apparatus

Basic and Integrated SPS



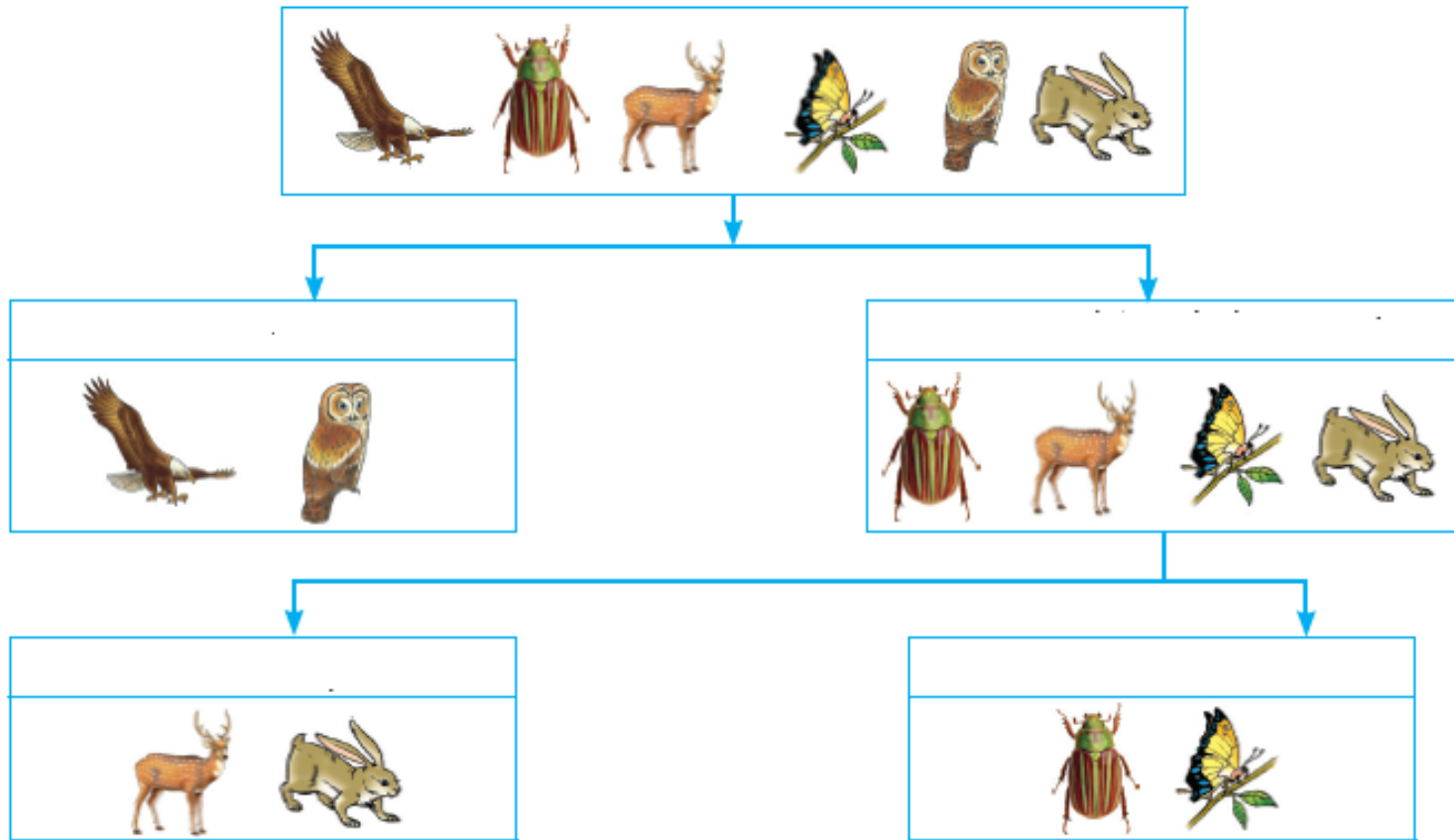
Using an object,
e.g. orange,
identify all the
SPS here

Observing



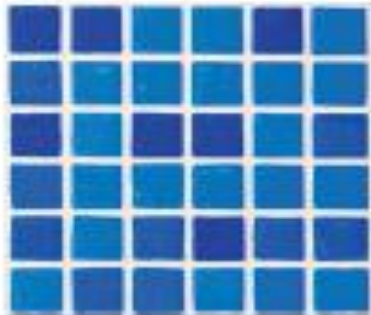
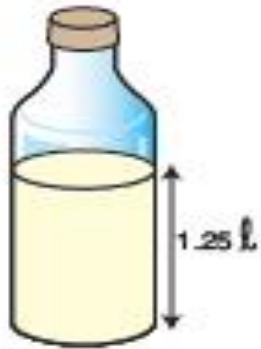
Common features?

Classifying



What feature is used in this classification?

Measuring & using numbers



What are being measured? Units?

Making inference



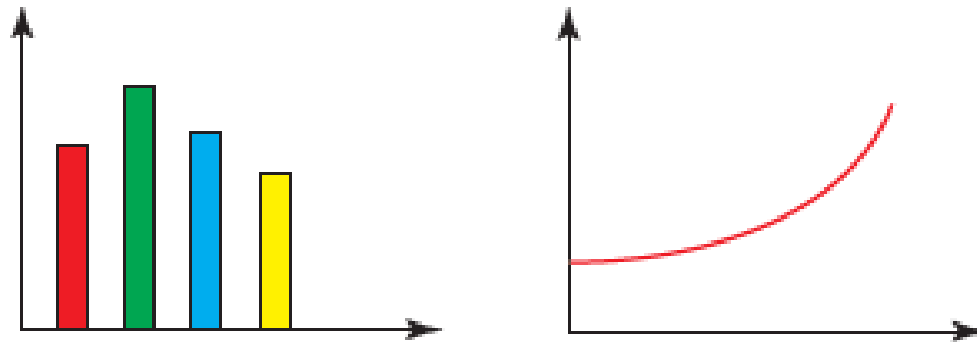
It turns blue litmus red...so, it is...?

Predicting



Will the egg float or sink in water and milk?

Communicating



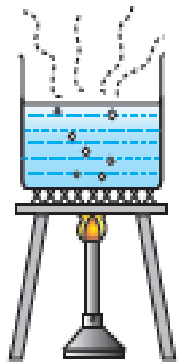
What information can you get from these diagrams?

Space-time relationship



What is the speed...?

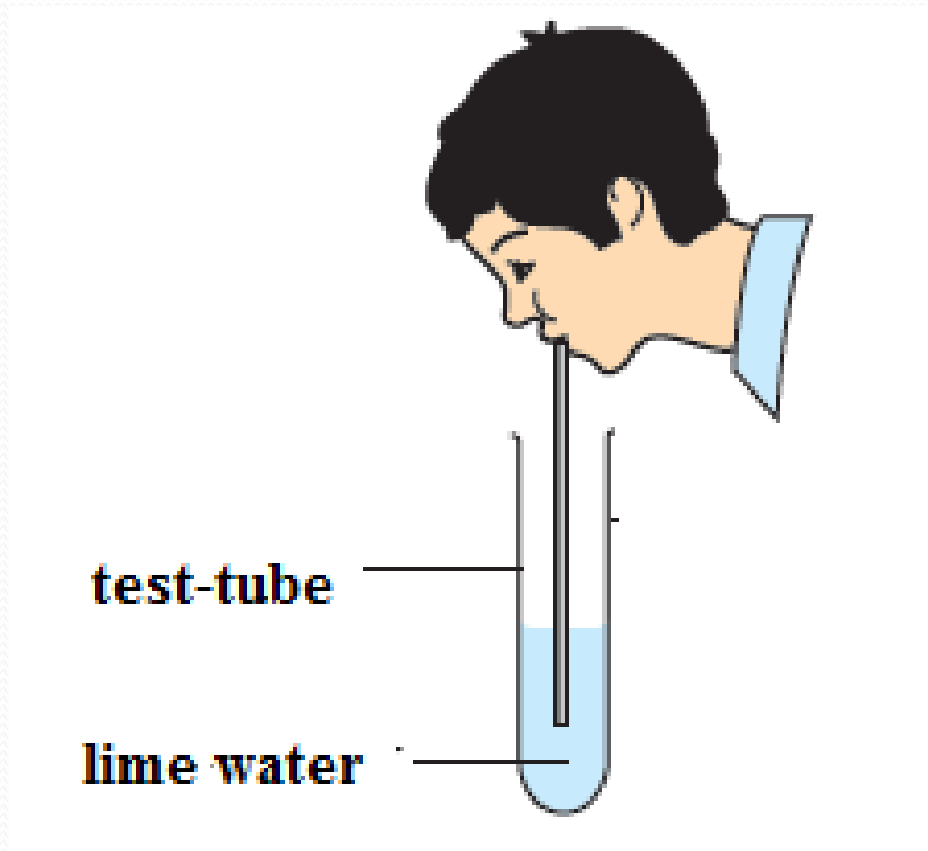
Interpreting data



Masa (min)	0	1	2	3	4	5
Suhu (°C)	30	40	50	60	70	80

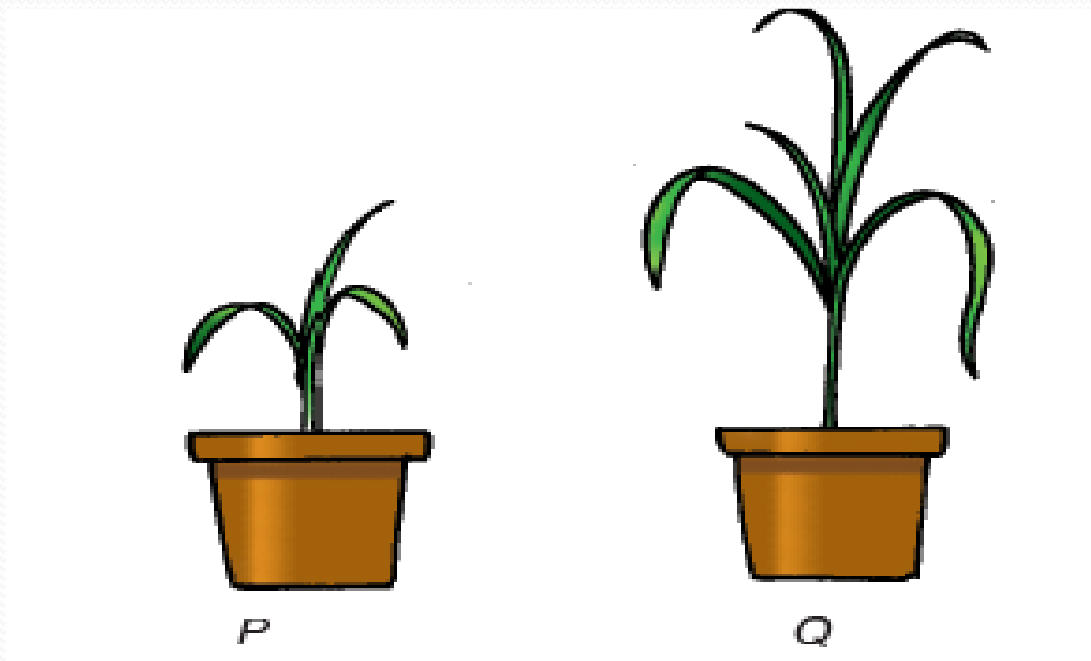
How much the temperature of the water has increased after heating for 5 minutes?

Defining operationally



How do you test the presence of carbon dioxide?

Identifying variables



Manipulated / independent variable?
Responding variable / dependent variable?
Constant variable?

Making Hypothesis



The stronger the flame....?

Experimenting



Are all the SPS used?...or
what are the SPS used here?

Scientific fact:

What happens when salt is added into ice?



Activity : making ice cream



What happens to the freezing temperature?



Ice cream in plastic bag.

Shake it in a container



Making ice-cream (for bigger quantity)



Manipulative skills...? Later on



Thank you