

Hypothetically speaking...



Your NameDate.....



“Every time I see a lot of ants inside our house, it rains the next day.” Great! You have made observations over a long period of time. You make inferences like ‘The ants are escaping from the rain.’ or ‘The ants are storing up food for the rainy day.’ You are seeing patterns in the ants’ behaviour, and your inferences allow you to make a prediction. ‘When I see more than 100 ants inside the house, it will rain within 24 hours’. Now that’s not a wild guess, but based on repeated observation.

You are now in a position to come up with an **hypothesis**. An hypothesis is from the Latin ‘hypo’= little and ‘thesis’ = theory, so it means mini-theory. A good hypothesis is always based on a lot of observations. In fact, the most important thing is to look for patterns. So, if you often see ants coming into the house, and then rain coming soon after, your hypothesis may be ‘Ants always come into the house before rain.’

In science, a hypothesis must be **testable**. You need to design an experiment to test it. First, it is good to ask your hypothesis as a question. For example ‘Does it always rain within a day, if there are more than twenty ants in the house?’

Once you have a question, you can design an experiment to answer it. You can record when ants occur in the house, and every time it rains. If it rains every time there are more than twenty ants in the house, there is evidence in favour of your hypothesis.

In science, you can never prove your hypothesis. You can only prove your hypothesis to be wrong. This is also true of any scientific theory. Theories are always changing. Some are thought to be correct for hundreds of years, only to be eventually proven wrong. Your hypotheses are a good attempt to understand the world. In science, you must be willing to be proved wrong.

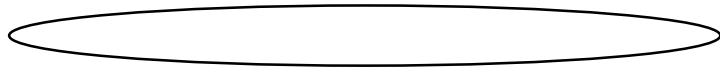
Today’s **experiment** is to help you come up with your own hypothesis.. You will be given 3 dice. You will need to roll them together 100 times. First, make a prediction, then start with your observations. Record your observations about how often each number comes up in the table provided. Look for any pattern to develop. Base your hypothesis on this pattern. Your hypothesis will be tested against the class results.

Part 1. Purpose of the text

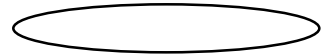
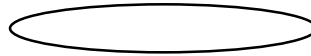


Find the key ideas from the text, and their meaning in the context of the experiment. **Organise** below.

a. Title (purpose)



Key word(s)



Line no.s

Meaning in context

• _____

• _____

• _____

Part 2. Drawing Inferences. Analyse the text and **synthesise** replies to the following:



a. Why are scientific theories never proven correct? _____

b. Why must hypotheses be testable? _____

Part 3. Apply what you have learned from the text.



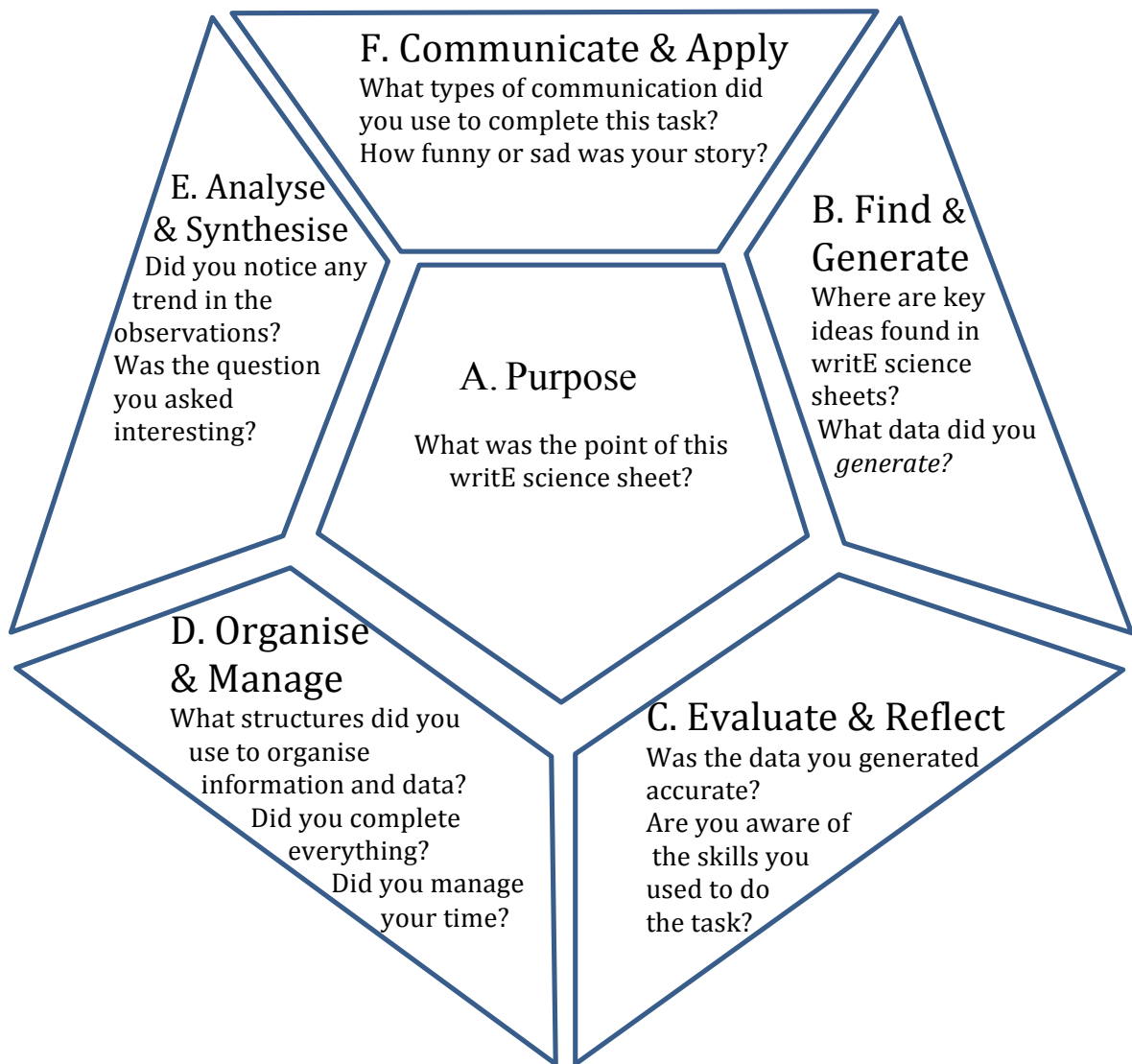
a. Write your prediction in first row of the table for how many times each number will come up. This should add up to 300. Then roll the dice 100 times. Record in tally style.

	1s	2s	3s	4s	5s	6s	total
Prediction							300
total							

b. **Analyse** your results. Are any patterns forming from your observations? Try writing a hypothesis. (An example could be '6s happen twice as often as 3s.'). Our hypothesis is:

c. Write your hypothesis as a question. (E.g. 'Do 6s happen twice as often as 3s?').

d. Use the class results to test your hypothesis. Was your hypothesis disproved? Or is it confirmed so far? Comment on the success of your hypothesis



Part 5. Evaluate and reflect.

Evaluate this activity and **reflect** by suggesting how to improve it.

Page 3 and onwards given out at teachers' discretion.

Teacher's notes:

This write science sheet is not intended to develop a sense of probability particularly, but to help students look for **patterns** in observations, and ask testable questions about these developing patterns.

The students should come up with a testable hypothesis, before class results are pooled. The class results may confirm some hypothesis, but a major point is to bring out the tentative quality of hypotheses (and theories).