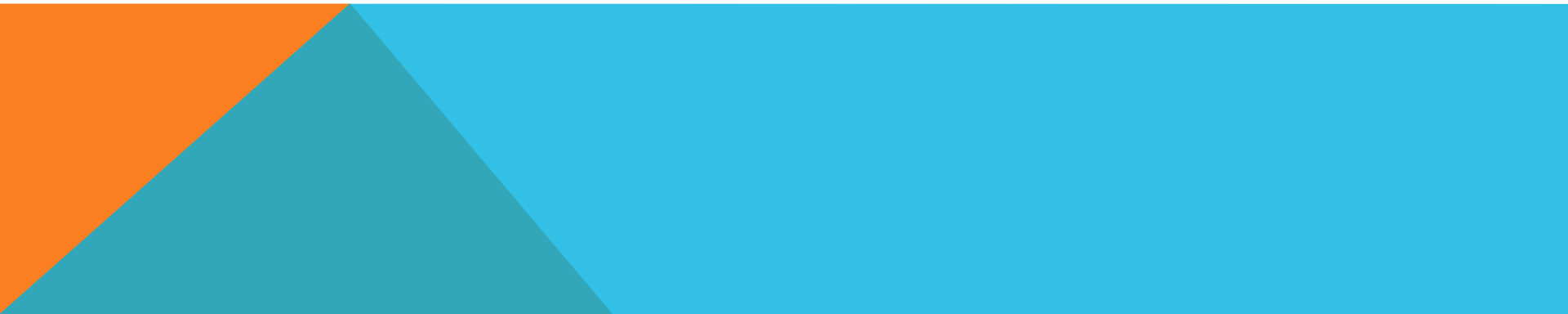# THE NATURE OF SCIENCE

TANGRAM ACTIVITY

List and label on each of the 4 initial pieces, a step of the scientific method.
1. "Mountain" shape

Ask a question notice something weird or interesting, natural curiosity

Form a hypothesis a testable, possible answer to your question

2. Large Triangle shape
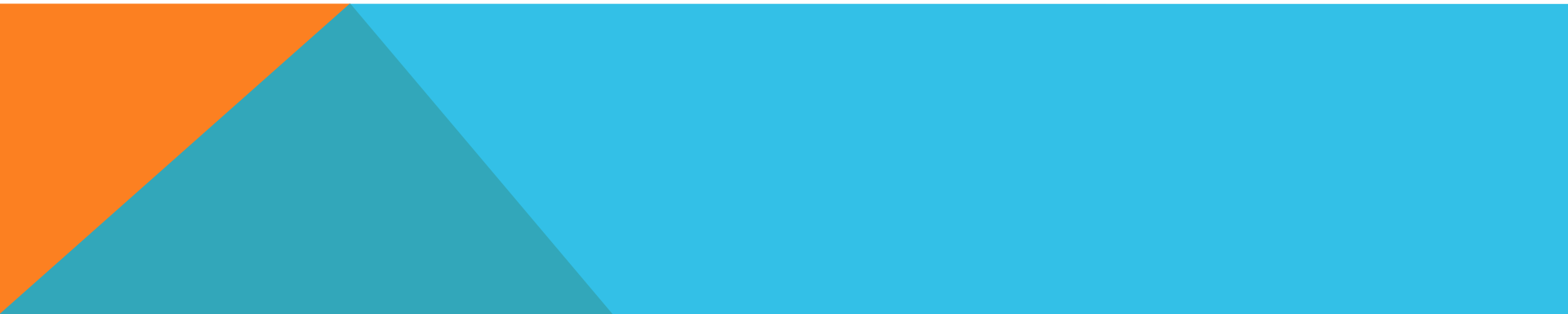
Controlled Experimentation has 3 main parts

- Manipulated (independent) variable- deliberately changed by researcher
- Responding (dependent) variable- what is measured
- Controlled variables- remain constant

3. "Fence- picket" shape
   Record and Analyze Results 2 types Data
- Qualitative data- observations that are descriptive
- Quantitative data- observations that include numbers

4. Small Triangle shape
Draw Conclusions, Share, Repeat

- Was your hypothesis supported of refuted?
- Multiple trials improve reliability
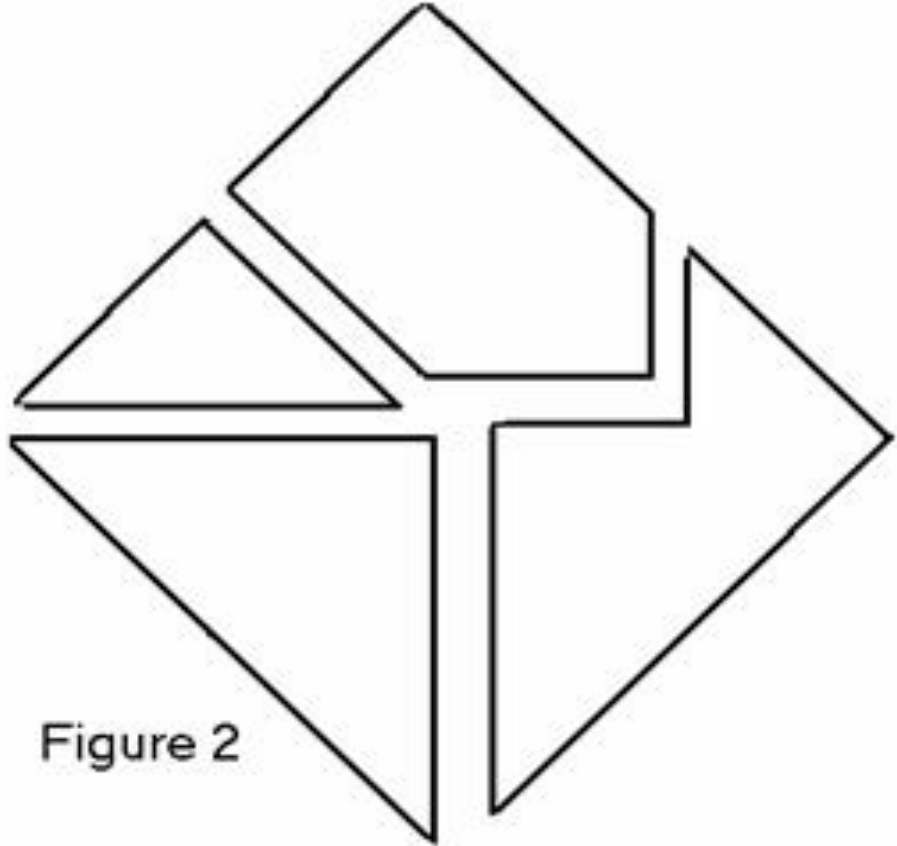
SOLUTION FOR PART 1

Figure 2

The purpose of this activity is to get students to think about the nature of science, and also, to show the importance of being an active participant in the learning process.

You have been given the definition of science in the past, but students should realize that
- science is dynamic,
- it is hands-on, and
- it changes as our knowledge of the world increases.

5. EXTRA Square piece

New Information

Evolving technology teaches us constantly

How are you going to change your thought to account for this new information?
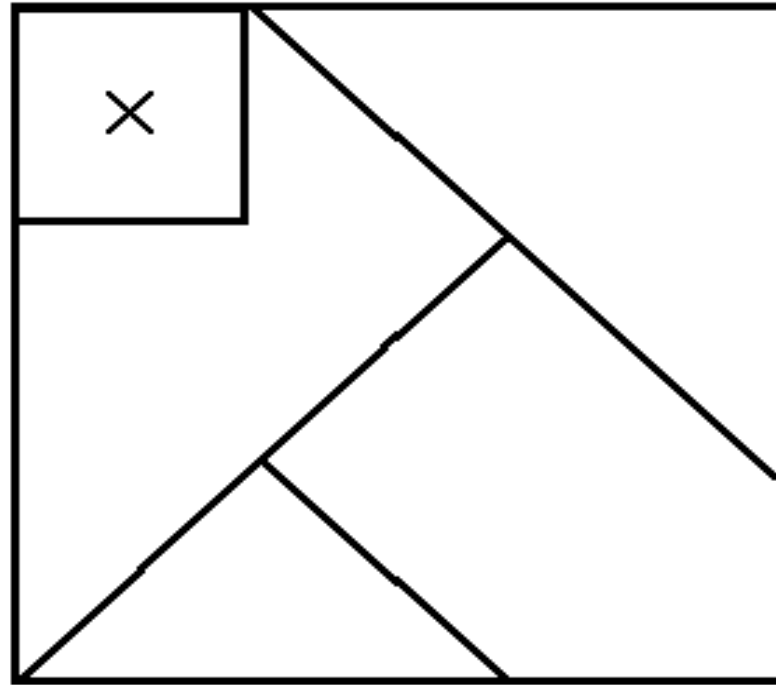
Solution for Part 2

Figure 1

Brainstorm with your group and list three ways how this activity is similar to "doing" science.
1.

2.

3.

1) Assume that the pieces fit together – nature is a puzzle that we have not yet solved;

2) Trial and error is an essential ingredient to science;

3) New information may require the old theory to be modified or discarded;

4) Our current information may be incomplete and therefore, our theories incorrect;

5) Sometimes, we get lucky and find the right answer;

6) Collaboration may be helpful;

7) Once we arrive at the answer, it makes perfect, elegant sense.