



## Science Process Skills With Guiding Questions

During any citizen science investigation, students will need to use a combination of science process skills to develop their understanding as they conduct research and collect and process data. By practicing the skills below, youth will learn how scientists think about and approach problems. They will also learn how to apply this process to other situations and will become better critical thinkers, collaborators and 21st century citizens.

**Directions:** *These science process skills are important to use during different stages of a scientific investigation. Check off the skills that youth will need to master during your investigation. Then, when you are implementing a citizen science activity, try using these questions to prompt student thinking as they progress through the project.*

### Making observations and asking questions:

- What do you notice?
- What do you see/smell/hear?
- Can you describe what is happening?
- What do you already know about what you are observing?
- What are you curious about?
- What would you like to know more about?
- What do you think is happening/predict could happen?
- How do you think x could be affecting y?
- What do you think is causing the things you notice?

### Planning and executing investigations:

- What do you want to discover?
- What factors must we consider when setting up an investigation?
- Can you identify or describe variables and controls that will be in place?
- What will you change?
- What will need to stay the same?

### Collecting and analyzing data:

- What are you trying to learn or discover?
- How can we test this idea?
- What do you want to measure?
- Over what period of time do you plan to make observations?
- What will you need in order to organize your data?

### Developing and using scientific models:

- What explanations exist for what we have observed?
- Where can we look to find similar experiments/ideas?
- Are we able to identify common trends or ideas?



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### Engaging in argument from evidence and constructing explanations:

- What did you learn from your observations?
- What is the main idea?
- What could predict would happen in the future?
- Why do you think that?
- How did you come to this conclusion?
- What leads you to believe that?
- Are you making a judgement or inference?
- Are you relying on data and factual information?

### Sharing findings:

- How can you communicate your discoveries with others?
- Can you create a poster, video, performance, blog post or other way to describe and communicate what you learned?