

Dear Students and Families,

The following packet is completely optional, however, it is a great opportunity for students to continue scientific thinking in the summer. The goal of this packet is to encourage curiosity, critical thinking, and exploration of the world around us.

One of the fundamental skills students develop in middle school science is learning how to make sense of the things they encounter in everyday life. Scientists do not always have immediate answers, instead, they ask questions, make observations, develop hypotheses, gather evidence, and revise their thinking as they learn more. These same skills help students become independent learners.

As students work through these activities, I encourage them to:

- Ask questions and make observations about the world around them
- Make predictions and hypotheses based on these observations
- Look for evidence to support or challenge their ideas
- Make connections between new information and what they already know
- Consider multiple explanations for what they are observing
- Persevere when answers are not immediately available and continue investigating
- Reflect on the activities they've completed and make note of things they'd change or improve if they were to do it again

Science isn't about memorizing facts, it's a way of thinking. Curiosity, perseverance, and a willingness to learn are some of the most valuable habits students can develop. My hope is that these activities inspire students to wonder, investigate, and discover throughout the summer.

Have a wonderful summer,

Ms. LeMay

Option 1: The Claim Investigator

Students choose a claim they hear in everyday life and investigate whether evidence supports it

Examples:

- Plants grow better when you talk to them.
- Cold weather causes colds.
- Energy drinks improve performance.
- Dark-colored cars get hotter than light-colored cars.
- Listening to music helps people focus.

Student Tasks:

- Research the claim
- Gather evidence from multiple sources
- Evaluate the quality of evidence
- Make a conclusion

Follow up Questions:

1. What did you notice?
2. What patterns did you observe?
3. What was your hypothesis?
4. Did the evidence support your idea?
5. What surprised you?
6. What new questions do you now have?
7. What would you change if you repeated the investigation?

Option 2: Design a Controlled Experiment

Students identify a question and design an experiment to test it

Examples:

- Which paper towel brand absorbs the most water?
- Does water temperature affect dissolving rate?
- How does ramp angle affect speed?

Students should try to identify:

- Independent variable
- Dependent variable
- Constants
- Control group (if appropriate)
- Number of trials

Follow up Questions:

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2. What patterns did you observe?
3. What was your hypothesis?
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6. What new questions do you now have?
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Option 3: The "Notice and Wonder" Phenomenon Journal

Instead of collecting observations, students investigate unexplained phenomena in everyday life

Examples:

- Why do puddles disappear?
- Why are some insects only active at night?
- Why does metal feel colder than wood?
- Why do birds gather on power lines?

Notice: What do you observe?

Wonder: What questions arise? What might explain it? What observations support or challenge your explanation?

Follow up Questions:

1. What did you notice?
2. What patterns did you observe?
3. What was your hypothesis?
4. Did the evidence support your idea?
5. What surprised you?
6. What new questions do you now have?
7. What would you change if you repeated the investigation?

Option 4: Microclimate Investigation

Students compare environmental conditions in different locations

Examples:

- Shade vs sunlight
- Pavement vs grass
- Near trees vs open areas

Collect:

- Temperature
- Humidity
- Light intensity
- Wind conditions

Analyze

- Which location is warmest?
- Why?
- What evidence supports the explanation?

Follow up Questions:

1. What did you notice?
2. What patterns did you observe?
3. What was your hypothesis?
4. Did the evidence support your idea?
5. What surprised you?
6. What new questions do you now have?
7. What would you change if you repeated the investigation?

Option 5: Reverse Engineering Challenge

Students choose a household object

Examples:

- Pencil
- Water bottle
- Shoe
- Umbrella
- Phone charger

Investigate:

- What problem does it solve?
- Why is it made from those materials?
- What trade-offs exist?
- How could it be improved?

Extension:

- Redesign the object using scientific reasoning

Follow up Questions:

1. What did you notice?
2. What patterns did you observe?
3. What was your hypothesis?
4. Did the evidence support your idea?
5. What surprised you?
6. What new questions do you now have?
7. What would you change if you repeated the investigation?

Option 6: Long-Term Ecological Observation

Observe the same location all summer

Examples:

- Backyard
- Pond
- Garden
- Local park

Record:

- Species observed
- Weather conditions
- Seasonal changes
- Human impacts

Analyze

- What patterns did you notice?
- Which organisms appeared most often?
- What relationships between organisms exist?

Develop a food web or ecosystem model

Follow up Questions:

1. What did you notice?
2. What patterns did you observe?
3. What was your hypothesis?
4. Did the evidence support your idea?
5. What surprised you?
6. What new questions do you now have?
7. What would you change if you repeated the investigation?