Guiding Students to Design and Conduct Investigations

There are numerous investigations that teach and assess. Here are some sample questions to ask students as they work through their investigations.

(Students can also use these questions and examples as a guide to plan, design and carry out a fair test investigation. The teacher and/or peers can also use this guide to review each other's work and suggest ways to improve.)

Testable Questions

Can you answer this question only by experimenting?
(A Testable Question: Does a banana peel decay faster than an apple peel?)
(Not Testable: Why is the sky blue?)

- What are you curious about?
- What do you want to find out?
- What do you already know about this?
- What is your testable question?

Hypotheses and Making Predictions
What do you think will happen?

- What is your idea?
- What do you already know about this that makes you think so?
- Can you state your prediction to show what you think will happen or change? (When I do this _____, I think that _____will be the result.)

Procedures
How will you test this? What materials will you need? What are the variables?

- What is your idea for an exploration? Write out each step so someone else could do it from your directions.
- What will you need? Try to be specific. Do not forget your tools for measuring.
- How will you be sure it is a fair test?
- What are the variables that will stay the same? What might change? What will you observe?

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Collecting and Organizing Data
What actually happened?

- What did you see? Hear? Smell? Can you add details to your observations?
- What actually happened?
- What did you measure?
- What units of measure (minutes, inches, etc.) will you label in your data?
- Will your data be in a chart? Graph? How will you label the important headings?
- Are there important dates or times included with your data? How often did you record data?
- Can you make a drawing or drawings to clearly show and explain your results? What will be labeled?

Drawing Conclusions
What did you find out? What have you learned?

- Remember your prediction? Did you get the results you expected? Can you use examples from your data to support your results? Can you explain why this happened or extend your thinking about this now?
- Did anything go wrong along the way? Did you have to change your experiment along the way?
- Did anything surprise you?
- Do you have any new ideas or new questions?

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