Designing Effective Projects: Teaching Thinking Assessing Thinking in a Preschool to Year 4 Classroom

Assessing Thinking: Year 2 to Year 4

In <u>The Great Bean Race</u> Unit Plan, young botanists investigate plant growth as they compete in a lima bean stalk growing competition with students from other geographic locations.

Assessing Process

As students conduct a series of experiments about plans, they write in their journals drawing conclusions about what they observe. The teacher uses the following checklist to assess their scientific thinking.

| 1. Observations are recorded in clear, scientific language. |
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| 2. The hypothesis is stated in a good sentence that includes a conclusion about what was |
| observed and the reason it occurred. |
| 3. Hypothesis is testable. |
| 4. The hypothesis is supported logically by the observations. |
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Assessing Product

The following rubric describes levels of thinking about the science that students are learning.

Science Content Rubric

| | _ | | | |
|----------------------------------|------------------------------|----------------------------------|--------------------------------|-----------------------|
| Content | 4 | 3 | 2 | 1 |
| Journal responses, | The | The | The | The |
| participation in | student shows a | student shows | student shows | student |
| activities, and | full | understanding | some | shows |
| discussion show | understanding | of the features | understanding | minimal |
| the student's ability | of the features | and processes | of the features | understandi |
| to: | and processes | of plant growth. | and processes | ng of the |
| | of plant growth. | - . | of plant growth. | features |
| Understand | - | The | - . | and |
| the features and | The | student is | The | processes |
| processes of | student can fully | developing the | student is | of plant growth. |
| plant growth | theorize, plan, | ability to | lacking in the | giowiii. |
| Tt | and carry out experiments, | theorize, plan, and carry out | ability to theorize, plan, | The |
| Theorize, | and analyze and | experiments, | and carry out | student is |
| plan, and carry | report | and analyze and | experiments, | unable to |
| out experiments, and analyze and | conclusions of | report | and analyze and | plan and |
| report | those | conclusions of | report | carry out |
| conclusions of | experiments. | those | conclusions of | experiments |
| those | • | experiments. | those | independen |
| experiments | The | | experiments. | tly. |
| , i | student explains | The | | The student |
| Explain | fully how asking | student explains | The | has |
| how asking and | and answering | one way of | student has | difficulty |
| answering | questions | asking and | difficulty | reporting conclusions |
| questions are | promote | answering | explaining one | Conclusions |
| part of the | scientific understanding. | questions to promote | way of asking and answering | • |
| process of a | understanding. | scientific | questions to | The |
| scientific | The | understanding. | promote | student is |
| investigation Compare | student | aria orotarianig. | scientific | unable to |
| prior knowledge | compares prior | The | understanding. | explain how |
| to the results of | knowledge to | student | | to answer |
| a scientific | the results of a | compares prior | The | questions to |
| investigation | scientific | knowledge to | student | promote |
| Ĭ | investigation | the results of a | compares some | scientific |
| Organize | with clear | scientific | prior knowledge | understandi |
| evidence of | distinctions | investigation | to the results of | ng. |
| change over | between the | with some | a scientific | The |
| time | two. | distinction between the | investigation with little | The student |
| | The | two. | distinction | measures |
| Develop | student carefully | two. | between the | and records |
| models | and accurately | The | two. | change |
| (illustrations and charts) to | measures and | student carefully | | over time |
| explain how | records change | measures and | The | with many |
| objects, events, | over time. The | records change | student | errors, |
| and/or | student | over time. The | measures and | which |
| processes | develops | student | records change | makes the |
| work | exceptional | develops | over time with | information |
| | models | models | some errors. | difficult to |
| | (illustrations and | (illustrations and | The student | understand. |
| | charts) to explain how | charts) that explain how | develops models | The |
| | σλριαπ πυw | explain now | IIIUUEIS | TITE |

| | objects, events, and/or processes work. | objects, events, and/or processes work. | (illustrations and charts) with assistance that explain how objects, events, and/or processes work. | student does not develop models or does not explain how objects, events, and/or processes work. |
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Self-Assessment

At the end of the unit, the students will write a reflection in which they answer the following questions:

- 1. During this unit, when did you think most like a scientist?
- 2. What evidence shows that you were thinking like a scientist then?
- 3. What was the easiest kind of thinking for you during this unit?
- 4. What was the hardest kind of thinking?
- 5. What are you going to work harder on during the next science unit?