

Appendix 1: Characteristics of Performance Tasks

Essential and valid

- task based on identified learning outcomes in grade-level curriculum
- task focuses on key concepts, skills and processes, in curriculum, NOT tangential
- task deals with "big ideas", big issues in the curriculum and subject discipline
- task stimulates students to make connections and generalizations that will increase their understanding of the important concepts and processes

Authentic "hands-on" application

- task is active
- students are the "mathematicians" and use the skills and process of mathematics
- task involves students in real applications of their skills and knowledge, NOT contrived activities for activities' sake
- task grounded in real-world contexts - real-life problems, real-world applications
- task has specific purpose and audience
- task uses processes appropriate to the subject discipline
- task assessment answers the question "Can you use it?" rather than the question "Do you know it?"

Open-ended

- students have some choice selecting or shaping the tasks
- task provides opportunities for decision-making
- task has a variety of acceptable approaches
- task is equitable, allows for a variety of learning styles
- task allows for a broad range of performance
- task leads naturally to extensions
- task has a variety of acceptable solutions, NOT one right answer or set of answers
- requires complex performance beyond what could be assessed by a typical pencil and paper assessment
- extended task that involves sustained work and often takes several days
- task is "freeing", it encourages students to be divergent thinkers and thoughtful risk takers

Engaging, valued

- task is meaningful to students
- task is interesting and engaging for students, it promotes persistence
- students value the outcome of the task
- task stimulates and sustains their thinking
- task is thought-provoking
- task fosters persistence

Appendix 2: Attributes and Dispositions

Attitudes and Dispositions Chart: Teachers can use this chart as they develop performance tasks or as a template for taking notes while observing students.

<p>Has a positive attitude towards science</p> <ul style="list-style-type: none">• looks forward to doing science• demonstrates a desire to learn science• desires to make sense of the natural world (qualitatively and quantitatively)• sees value and usefulness of a store of scientific knowledge, previous scientific knowledge• uses the language of science	
<p>Demonstrates the habits of minds of science</p> <ul style="list-style-type: none">• is curious, has a sustained intellectual curiosity• has a sense of wonder• ponders observations• asks questions, values questions• is open to new ideas• has a tendency to consider alternatives, explore alternate views, generate multiple options• seeks understanding• has an appreciation of evidence• has an awareness of assumptions, questions the given• has a healthy, informed skepticism• suspends judgment• seeks pattern and connections• has willingness to change opinion• has an aversion to superstition	
<p>Recognizes and uses science</p> <ul style="list-style-type: none">• uses science to make sense of their world• is sensitive to opportunities to apply science skills and processes• is inclined to apply science skills and processes• uses science to make sense of the natural world (qualitatively and quantitatively)• offers explanations from store of scientific knowledge, previous scientific knowledge	

Attributes and Dispositions Checklist #1

	Never or Rarely	Sometimes	Often	Almost always
Has a positive attitude towards science				
• looks forward to doing science				
• demonstrates a desire to learn science				
• desires to make sense of the natural world (qualitatively and quantitatively)				
• values, sees usefulness of a store of scientific knowledge, previous scientific knowledge				
• uses the language of science				
Demonstrates the habits of minds of science				
• is curious, has a sustained intellectual curiosity				
• has a sense of wonder				
• ponders observations				
• asks questions, values questions				
• is open to new ideas				
• has a tendency to consider alternatives, explore alternate views, generate multiple options				
• seeks understanding				
• has an appreciation of evidence				
• has an awareness of assumptions, questions the given				
• has a healthy, informed skepticism				
• suspends judgment				
• seeks pattern and connections				
• has willingness to change opinion				
• has an aversion to superstition				
Recognizes and uses science				
• is inclined to apply science skills and processes				
• uses science to make sense of their world				
• is sensitive to opportunities to apply science skills and processes				
• uses science to make sense of the natural world (qualitatively and quantitatively)				
• offers explanations from store of scientific knowledge, previous scientific knowledge				

Appendix 3: Making Connections

Teachers can use the following prompts when looking for evidence that students are making connections to personal experience and prior knowledge, as well as among science, technology, society, and environment.

<p>Prior knowledge</p> <ul style="list-style-type: none"> • Have you ever seen this before?...where?...when? • Where else might you find something like this? • How is this like something you already know? 	
<p>Personal experience</p> <ul style="list-style-type: none"> • Have you ever used this information?...has your family? • How does this affect people? ...you?...your family?...people who live in other places? 	
<p>Technology</p> <ul style="list-style-type: none"> • How have people used this scientific understanding to invent things? • What technology has arisen as a result of this scientific understanding? • What scientific knowledge is this technology based on? • How has this technology affected you?...individual people?...society? ...the environment? 	
<p>Environment</p> <ul style="list-style-type: none"> • How does your environment affect you? • How does your environment affect the science you need to know? • How does your environment affect the technology you are interested in? 	
<p>Society</p> <ul style="list-style-type: none"> • Why do you think scientists study this? • How can people use this information in their lives? • How has this scientific understanding helped society? • How does our society decide what science is studied? ...what technology is developed? ...how we use the environment? 	