



Formative Assessment

Assessment for learning, also called formative assessment, is integral to the *Focus on Energy* curriculum. It provides the means to identify and chart the development of students' ideas and understandings, to identify obstacles they encounter in their learning, and to inform the teacher's decisions regarding next steps in the learning.

Students' progress in both science content (key energy ideas) and the practices of science are assessed.

Assessment Resources

The Teacher Guide supports ongoing formative assessment, e.g., tips for students' ideas to listen for during discussions, examples of typical student ideas, and suggestions for constructive teacher responses. Learning experiences themselves provide opportunities for assessment. You will also find two assessment probes in each unit, a Quick Check and a Wrap Up probe, with interpretation guides.

Quick Checks

Each unit includes a classroom-tested item that probes understanding of a key idea. For example, in the Motion Unit, the Quick Check assesses understanding that if an object is moving, it has (motion) energy. Or put another way, motion is evidence that an object has energy.

Wrap Up Items

At the end of each unit, a classroom-tested item probes understanding of a key idea. For example, in the Motion Unit, the Wrap Up assesses understanding of indicators (evidence) of energy that can't be seen. If an elastic object is deformed, it has elastic energy, the more deformed the more elastic energy. If an object such as a giant paint paddle is both deformed and is in motion, this is evidence the giant paint paddle has both elastic and motion energy.

The Model of Energy

This is a class project. The Model of Energy is a list of statements proposed by students and recorded by the teacher. As students add to or revise their Model of Energy, the teacher is able to see to how the group is progressing towards the learning goals for each investigation. For

example, at the end of Motion 1, although statements may be expressed in various ways in different classrooms, all models should state that energy can't be seen, an object in motion has motion energy or motion tells us that an object has energy, an object can have different amounts of motion energy, for example, the faster the ball rolls, the more motion energy it has. Images of example classroom Models are included in the Teacher Guide.

Students' Notebook writing

Students write regularly in their notebooks. There is a wealth of information in these pages and a teacher will need to decide how to monitor students' writing. Sometimes the teacher can check notebook entries as students write during regular class activities and make instructional decisions on the spot. Once or twice during a unit, the teacher may decide to collect and read through all notebooks, checking to see if there are points of confusion or if an experience needs to be revisited – by the whole class or a few individuals – or if the class is ready to move on.

Students as partners in assessment

Ideally students will have rubrics or guidelines for evaluating their own work. The scope of this project did not include the development of rubrics or interpretation guides for notebook entries or drawings. We have found that a productive professional learning activity for groups of teachers is the development of rubrics or evaluative criteria – for use by teachers or students themselves.