

**Topics:** Investigation and Experimentation, Attributes & Properties, Observations, Models

### Materials List

- ✓ Model apple, (plastic, wood, etc.)
- ✓ Real apples
- ✓ Plastic knives
- ✓ Small paper plates
- ✓ Paper towels for clean up

This activity can be used to support the teaching of:

- Conversation (Common Core English Language Arts Standards: Speaking & Listening, Grades K-12, 1; Grades K-3, 3)
- Vocabulary (Common Core English Language Arts Standards: Grades K-5, Language, 5; Grades K-12, Language, 6)
- Science & Engineering Practices (Next Generation Science Standards: Grades K-12)

## A Model Apple

Seeing the Usefulness and Limitations of Models



Students observe and analyze a real apple and then compare their observations with those of a model apple.

### To Do and Notice

1. Distribute real apples, plastic knives, and paper plates to students.
2. Working in small groups, students carefully observe the apples and brainstorm a list of attributes/characteristics of an apple: shape, color, size, density, patterns, scent, internal structure, etc. Each group should list at least 10-15 characteristics of their apple.
3. Each group takes turns sharing their list with other groups. Compile a master list of all the characteristics. (Optional: Turn this activity into a challenge. The group with the most unique items wins the challenge.)
4. Distribute model apples.
5. Students cross off characteristics/attributes no longer applicable. This can be done in small groups or as a whole class.
6. Optional: Have students make a list of misconceptions that can be made using the model apple.
7. Students review and analyze, data collected comparing attributes of a real apple to the *model*. Which characteristics are present in both? Students will discover that the model apple has very few attributes or characteristics in common with a real one.
8. Repeat step 5 with a colored image of an apple, and then with a black and white drawing or cartoon image of an apple. Finally, use a card with just the printed word “**apple**”. Optional: As the final step, show the students the word apple written in another language, preferably another alphabet.

### The Content Behind the Activity

Every object can be defined by attributes, including physical properties (e.g., material, shape, color, size) and chemical properties (e.g., reaction to other chemicals). In everyday life and in science, we rely heavily on models to learn from and communicate with. Models are an excellent tool in many regards; however they can not represent all attributes of an object or concept. It is important for us as learners to realize that every model has limitations. Whenever possible, learning from a real or hands-on experience is richer than otherwise.

### Taking it Further

Students can make/build DNA or cell models and then relate which attributes are well represented and which are difficult or impossible to represent in a model or visual form.

Web Resources (Visit [www.raft.net/raft-idea?isid=228](http://www.raft.net/raft-idea?isid=228) for more resources)