

A Guide for “ Discussing Models”

Activity:

Using the idea of varying or changing brightness as discussed in Part A, have the students come up with models. Do this in groups, with a share session done at the end. For example, have groups swap the models and examine each other's with sleep shades on if the models are physical.

The purpose of the above activity is to construct a model. It could be a mental model, a physical model, a diagram, a computer model, etc. Explain to the students that the model construction activity for changing brightness was a start for thinking about how objects in space can change.

Then you can launch into a discussion of models in general. The following might help with the general understanding. Following that is a discussion of models used in IDATA, along with some questions.

The word model is used in everyday language in various ways - a model student, a fashion model, a model train. Scientific models serve as frameworks that help scientists think about some aspect of nature. The celestial sphere is one such model. The celestial sphere is not real, we know stars are scattered at different distances, but the model helps us think about the sky and make predictions about where we can find objects at different times of the night or the year.

Some scientific models are imprecise, for example, a model of how different aspects of the brain work. Other models are very precise and can be expressed as a set of mathematical equations.

No matter how a model is constructed, they are not meant to be a statement of the truth. It does not have to be true to be useful. But, if you begin to think of a model as true, it can mislead us instead of helping us.

(Paraphrased from Michael Seeds text “Horizons: Exploring the Universe”)

We have used a number of models as part of the IDATA Exploration. They are designed to help explain important aspects of celestial motion, telescopes, CCD cameras, asteroid orbits and now, an explanation for why asteroids vary in brightness over relatively short time periods. Take some time to discuss the models we have made so far - there is a journal box for the students to answer in.

1. What models have we made?
2. What were these models designed to help us understand?
3. Can you think of any ways these models are not accurate?
4. How can these models be helpful even if they are not perfect?

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