

Name: \_\_\_\_\_ per \_\_\_\_\_ date \_\_\_\_\_ mail box \_\_\_\_\_

## Cosmos Episode 6 - A Spacetime Odyssey - <http://www.dailymotion.com/video/x2idgp7>

**Directions:** While watching this video try and think about the overarching theme and what makes it all possible for us to see any of the amazing imagery to begin with at all.

But first 1<sup>st</sup> - Ask yourself, what is a model? What makes a good model? Discuss as a class.

List ideas here: \_\_\_\_\_

Why do we need models at all? Discuss as a class.

List ideas here: \_\_\_\_\_

**Definition:** Model (noun)

a two or three-dimensional representation of something, typically on a smaller scale than the original.-

Try and answer the *detail questions* as you watch. Focus on your groups *thought questions* so we can reflect and relate them to the overarching theme later. Make some notes during the film on your specific *thought questions* on the back. Be sure and **read** the *thought questions* **before** watching the film.

Detail Questions: Answer at least 5

1. What are more numerous, stars in the sky or atoms in your eye?
2. How does the number of atoms in every breath we take compare to all the stars in all the known galaxies?
3. What is the only element that is flexible enough to create different structures necessary to sustain life?
4. What is the “ash” in the Sun’s nuclear furnace?
5. How are heavier elements, like iron, made?
6. Why can we not go further back than 15 minutes into January 1 on the “cosmic calendar”?
7. About what size was the universe when it was a trillionth of a trillionth of a trillionth of a second old?
8. What law of Physics made it possible for Neil not to flinch when the red ball came swinging back at his face?

## THOUGHT QUESTIONS

### Table 1 & 2

How is it we are actually able to see any of the inner workings of a dew drop? How does the film and Neil do this? What are some of the things on display in the film and how are we able to *see* any of it?

### Table 3 & 4

How did Neil deGrasse Tyson explain that the boy did not really touch the girl? What did he say? What did the film show? How did they show us that they don't actually really touch?

### Table 5 & 6

How was Charles Darwin able to accurately predict that the orchid on Madagascar with a foot long tube for hiding pollen must have had an obligate animal pollinator with a tongue equally as long?

How is it that Wolfgang Pauli like Charles Darwin was able to explain something that seemed so discrepant? He predicted there must be a particle to explain the apparent "breaking" of the law of conservation of energy in radioactive isotopes? **Can we really *see* the nucleus of an atom? How are we seeing them in the film?**

### Desk Land

What was used throughout the film to explain various phenomenon? What's so special about carbon? How do they depict what carbon *looks* like in the film?

"Neil talks about a lot of different things, but what is the common thread throughout that ties it all together?"

