



Teamwork Makes the Dream Work

As you have read, the Big Bang Theory is a theory, not a guaranteed fact, about how the universe came to be, and it proposes that all the celestial bodies we are aware of in the universe, such as stars, black holes, and supernovas, were created from intense heat and particles. Because of the work of Edwin Hubble and others, we now know that the universe is still expanding, and that expansion is accelerating. But do you understand what this means? Could you explain it to a younger student? Successfully? Using physical models of abstract ideas is often an effective way to learn and teach. For example, by using string, dots on a rubber band, balloons, or other mundane materials, we can make the invisible and enigmatic visible and easily understood.

We can understand this paradigm-shifting idea with simple tools by demonstrating the universe's movement with everyday objects. Working collaboratively, listening to our colleagues' ideas, and building models together, we work as partners—something that is key to scientific discovery because science advances when we cooperate, not when we compete. This idea is at the core of the United Nations Sustainable Development Goals—that we can learn more through collaboration. Moreover, it is also said that the knowledge acquired when we work with our hands, building things with others, is the knowledge that sticks.

01 Present!

Once your Maker is done, you're ready! Present live or create a video explaining the idea behind your model and how you worked collaboratively to create it.

02 Discuss!

Watch the demonstrations of the other groups' models and answer the questions.

- › Which most clearly shows the concept?
- › How important was collaboration for each group?

03 Get Informed!

Learn more about demonstrating complex, abstract scientific ideas with ordinary materials, and create another demonstration to share with younger students.

04 Take It on the Road!

With the help of your teacher, invite younger students to watch the demonstrations and ask questions.

DO

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In this Maker, you'll work with a group to create a physical model that illustrates the universe's expansion, making the concept clearer for younger students.

1. Research the concept of the expanding universe.
2. Brainstorm different ways the concept could be demonstrated.
3. Choose the tools and materials in the Maker Zone to build your model.
4. Build and test your model.
5. Prepare a presentation explaining why you used these materials.

