

## Video Transcript for the *Mystery Matter* Activity:

Hi, my name is Michelle and I am a member of the IBEX Education and Public Outreach team. We have designed a series of videos to show you how to facilitate the IBEX educational activities for informal audiences, such as museum visitors or after-school program participants. This video is for the activity titled “Mystery Matter.”

So, participants in this activity will observe the materials around them and in front of them and try to figure out what the “mystery matter” is.

So, Mystery Matter requires you to use some fairly easily obtainable materials. Some things you may already have on hand; couple things you may have to get.

So, we are going to start with the examples of solids. You’re going to need two examples— one is something solid; I have rocks in this container here [displaying container]. You can buy rocks, go outside and pickup rocks, as long as you have something that is solid that people can easily identify in the clear container, such as this beaker.

The other example of a solid would be ice. Now, I have some fake ice in here [displaying container], but you’ll want to use real ice because that is something that your participants will be able to easily indentify. And, again, you’ll want to have this in the same type of container. So, these are clear beakers. If you have something with a lid, that’s fine— it keeps things from spilling out.

Next, a liquid. The most easily identifiable liquid would be water. Just use the same type of container that you used for the solids and use that for the liquid.

Next, a gas. So, this is a little harder. If you want to use something like air, that’s great, use it as an example, but there’s really no way for people to see it. So, we’ve come up with a solution for that; we have a container of spray spoke. So, this is liquid spray spoke; and, when you shake it up and spray it out [demonstrating liquid smoke], it becomes a gas, and you can see it inside the container.

Now, it makes a pretty interesting view from your audience’s perspective. So, when you put it in, you’ll want to put the lid on, and you’ll be able to see it inside the container for a little while. So, this might be a great alternative to using just an example of air because it’s something your participants can see.

Alright, and you’ll also need a differently sized or differently shaped container [displaying example]. You’re going to be pouring the liquid into this container.

During this activity, participants are investigating the properties of volume and shape; and so, when you pour the liquid in, it's just showing that the liquid will take up the shape of the container that it's poured in. This one just happens to be round and bigger [showing example]. You can use any differently sized container. It may have a lid on it, it may not; that's up to you.

Finally, the last two items, you may or may not have on hand. You'll want a plasma ball. So, this is our example [demonstrating plasma ball] of a plasma, and you'll want a magnet, and this a bar magnet [displaying magnet]. So, for the plasma ball, they have many types that can be plugged into the wall; of course, then you're limited to where your outlets are to be able to do the activity. This one is battery operated, so we recommend getting something like this. Something small; it doesn't need to be huge, and just a regular bar magnet is all that you need. If you gather up all these materials, you'll be good to go for Mystery Matter.

So, the first thing you'll want to do is invite a few folks to come over and participate in your activity.

Now throughout this activity, you're going to ask them to observe the properties of the materials in the beakers, and observe as you test the properties of volume and shape; and then identify those materials as a solid, liquid, or gas. The important point to make clear is that energy is added to materials to transform them from one state of matter to another.

Then we get to the state of matter called "plasma." For something to become a plasma, enough energy must be added to the matter to strip off electrons surrounding the atoms that make up that material.

And, what participants will do is observe the plasma ball; of course, without the facilitator necessarily identifying it as a plasma ball, at first. They can touch it. They can touch the magnet to it. And, they can compare the properties of solid, liquid, and gas to the properties of what they see inside the plasma ball.

The end of the activity, you'll want to hold up a picture of the Sun or identify a nearby picture of the Sun— something that you may have on hand— just to identify an example of something that is made of plasma.

And the final science connection to make is that the IBEX spacecraft studies plasma's effects on the boundary region of our solar system.

So one additional point to make is that there's an optional at-home activity if you would like to give this out to participants who do the Mystery Matter activity. There's a family states of matter chart and we invite families to go around the house and identify the various states of matter that they see in everyday materials. Now, the point to make is, states of matter are all around us. It isn't just for science class or a fun day at the science center; this is something that we

encounter every single day. Now, we hope you've enjoyed learning about the Mystery Matter activity.

For more information or to download the lesson plan, please visit [www.ibex.swri.edu](http://www.ibex.swri.edu).

Thanks for watching!