

# **Apollo 13 At Home Challenge**

*April 2020 marks the 50<sup>th</sup> anniversary of the Apollo 13 incident. While we are experiencing social distancing, here is an Apollo 13-inspired activity you/ your family can do at home or you can participate with others online.*

**Note:** We recommend you do this challenge in two sessions.

**Session 1:** Review the Challenge; Decide who will be MC, who will be the Astronauts; Brainstorm your Materials List

**Between Sessions:** Both individuals/groups should gather their materials; MC person/group will construct their solution.

**Session 2:** MC will instruct the Astronaut's Build; Share and Debrief!

## **A review of the situation:**

**Here are links to two clips from the movie, edited for language:**

[https://docs.google.com/presentation/d/1\\_rlWpju33y21OXGDjfPwy6sAC5lcpf3ci8a2iZVuOMM/edit#slide=id.g4821216692\\_0\\_245](https://docs.google.com/presentation/d/1_rlWpju33y21OXGDjfPwy6sAC5lcpf3ci8a2iZVuOMM/edit#slide=id.g4821216692_0_245)

[https://docs.google.com/presentation/d/1\\_rlWpju33y21OXGDjfPwy6sAC5lcpf3ci8a2iZVuOMM/edit#slide=id.g4821216692\\_0\\_251](https://docs.google.com/presentation/d/1_rlWpju33y21OXGDjfPwy6sAC5lcpf3ci8a2iZVuOMM/edit#slide=id.g4821216692_0_251)

There has been a liquid oxygen tank explosion which has caused the mission to be aborted and astronauts have moved from the Command Module Odyssey into the LEM Aquarius. **In order to fix the problem to ensure the astronauts have oxygen, they must create a way to convert from a square shape filter to a hole for a round shape. All air must move through the square filter then into the round hole with no leaks.**

## **Are YOU up for the challenge?**

In the challenge, one person or persons will be the Mission Control crew on Earth, while the second person or persons will be the Astronaut crew aboard the Apollo 13 rocket's service module. MC will build a product that converts a square container to a cylinder. MC must give verbal instructions to the Astronaut crew on how to build the same design that MC has already assembled.

**Some ideas to consider:**

- You will not show one another the build until the very end of the challenge.
- The participants need to communicate with each other describing the materials they are using by shape, color, texture, and size.

- The idea isn't to necessarily construct something perfect in design but that communication is so good that both builds end up identical.

### **Materials:**

**Both groups must have the same materials.** Look over the list of possible materials listed below and agree on the general list of items your MC and Astronaut groups will gather. You don't need your design in mind yet. In fact, you should gather many different materials so there will be extra, allowing for decision making during the challenge.

**You must have one round container and one square.**

Ideas for a round container:

a can, plastic glass, empty wipes container

Ideas for square container (or rectangular):

a tissue or cereal box, leftover container or food container from the store (cold cuts, fruit)

Other materials you could use if both groups have them available:

a tube (paper towel, wrapping paper or one made of paper)

tubing (medical, hose, aquarium)

straws

pool noodle piece

foam or Styrofoam

aluminum foil

string

yarn

ziploc bags or any plastic bag

rubber bands

lots of tape – whatever you have

## **Time to Begin the Build!**

### **Build:**

Have the group in Mission Control do their build without the Apollo crew seeing them. It should take 15 minutes or less to do their build.

Once they finish their build, the MC team will need to establish contact with the astronauts so they can hear, but not see one another.

**The two groups cannot see each other but MC must give verbal instructions to the Astronaut crew on how to build the same design that MC has already assembled. Keep in mind it is important to use directional**

words, size, and be very specific.

Start a timer. The build phase should take 15 minutes or less.

## **Time's Up!**

**Comparison and discussion:**

After 15 minutes, it is time for the reveal!

Establish visual contact between MC and the Astronaut crew.

Compare the two designs. This is a good opportunity to generate a good discussion.

- Do your models have any significant differences?

If no: Good job! What made it possible to do that?

If yes: What are they? With the materials you had and the time limit, how could you improve your communication to avoid those problems next time?

## **Try Again?**

Optional: If you are a true engineer at heart, you know you could improve with another try! If you are not ready to end the challenge, take the designs apart and do the process again switching roles.

If so, the second design should be different than the first to give a good opportunity to work on improving communication. You will want your round and square pieces to be the same the second time but not necessarily the other pieces.

## **Share your results and earn a prize!**

Upload your pictures to [contact@astronaut.org](mailto:contact@astronaut.org). All participants will receive a prize, as supplies last.

*Want to know more about the Apollo 13 mission?*

Check out this NASA webpage: [https://www.nasa.gov/mission\\_pages/apollo/apollo-13](https://www.nasa.gov/mission_pages/apollo/apollo-13)

You might also be interested in this timely article on lessons learned from Apollo 13:

**“Houston, we have a problem.” – Apollo 13 Lessons for How to Act During an Emergency Incident**

<https://www.juvar.com/blog/webeoc/houston-we-have-a-problem-apollo-13-lessons-for-how-to-act-during-an-emergency-incident/>