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THE RETURN TO EARTH(A LANDER)

Written by Susan Odere

CLASS DESCRIPTION
In this class, students will learn more about space exploration, astronauts, visit to the moon, facts etc.

TOTAL CLASS TIME: 1 Hour

CLASS OUTCOME
By the end of this class, students will

- Learn more about heated air and gravity
- Learn more about Astronauts landing
- The class will be divided into groups to perform exercises and build a lander

INTRODUCTION

A few kilometers above the earth opens the main parachute, where the*Soyuz* Capsule to the ground sails.

SPACE EXPLORATION

Usually astronauts stay for six months on the space station. Then they return to the third back to Earth, while three other crew members remain on the station and only months off home later. The *Soyuz* Spaceship docked on the station and ignited a little later the engines against the direction of flight, making it slower and starting to

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decrease. Then it separates into several elements, of which only the capsule landing ground their way through the atmosphere to the Earth travels while the rest burns up in the atmosphere. The closer the capsule comes with the three astronauts of the earth, the more the increasingly dense layers of the atmosphere slow them down. Here, the air is heated such that it begins to glow. It is otherwise assumed to be often not so much at the friction of the capsule to the air particles but mainly due to the increased air pressure: The capsule compresses the air together - and when air is compressed, it becomes warmer.

Finally, the parachute opens and the capsule sails down further. The unusual gravity makes astronauts after long stays in space to create. Despite all training aboard the station, the muscles and the cardiovascular system have to get used again to the Earth's gravity. Also, the sense of balance is affected so after a few days, all will return to normal.

Spectacular receiving a capsule shortly after landing. In the background is a helicopter, the crew members will be taken to the nearest airport. From there it's on to Moscow or - at NASA and ESAAstronauten - in the US or the European Astronaut Center in Cologne. Credit: NASA / InBill galls

Even for us it is now time to return to our long journey into space to Earth - as always in the form of some playful hands-on exercises!

SIMPLE EXERCISE: It's getting hot!

Friction generates heat. When re-entry into the atmosphere is not the crucial reason for the high temperatures that occur outside of the capsule and faced by the crew with a heat shield is

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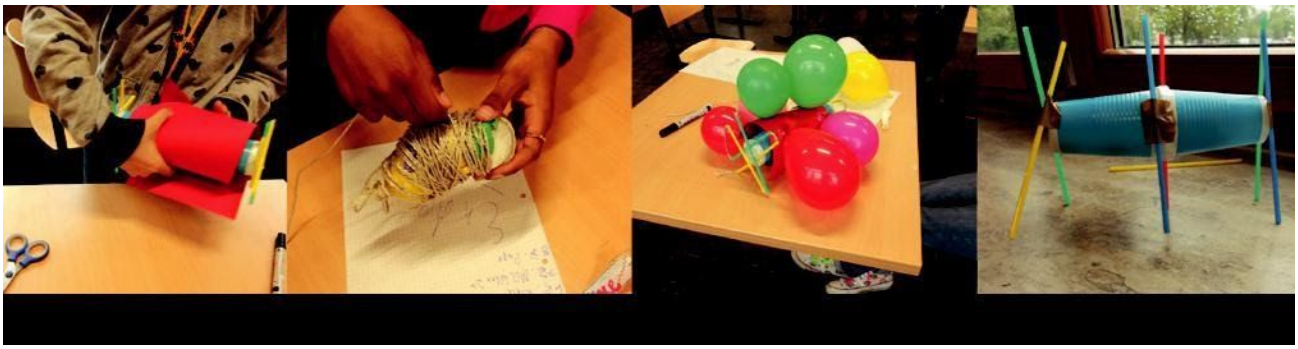
shielded. However, you can create a "warm-up exercise" present here little at the beginning. The children rub their fast hands and feel: it is warm!

EGG ASTRONAUT - get ready for landing!



MATERIALS NEEDED

Each team receives

- 2 paper cups
- 10 straws
- 5 balloons
- Cardboard
- 1 large piece of plastic wrap (trash bags, best already cut) approximately 5 meters of line
- Craft materials (scissors, tape, ruler, pen)
- 1 raw egg
- 1 small plastic bag (eg. As sandwich bags)

HINTS:

If you want to generally do not use food for such attempts, the raw egg can for. B. be replaced by a Christmas tree ornament. Whether egg or ball: Hold safety's sake, some of these "test objects" ready, in case already tinkering something breaks. You should also pack the fragile cargo before deploying them to groups in small plastic bags (each egg and each ball z. B. in a small sandwich bag) if something should get broken during casting.

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ARE YOU READY TO BUILD A LANDER?

The task of this experiment is clear: There must be a soft landing possible succeed! Because the astronaut is symbolized in this experiment by a raw egg, which is a real challenge not only for younger children. Analogous to the real Soyuz Capsule helps a parachute to slow the landing in the stairwell. Instead of braking rockets at a Soyuz mitigate landing at the last second contact with the ground in addition, we have in this experiment, however a small loan from a different field of space taken: Just as sometimes unmanned landings space probes on Mars "air bags" are used, we are using air balloons. In addition, paper cups, straws and a few other ingredients are only required - and the last leg of the flight can begin: We return to Earth! do buckle up and ready to land: Egg Astronaut

HOW IT WORKS:

The materials are distributed to small groups and let the children think Share: How can only with these "ingredients" a soft landing to ensure the raw egg remains intact as a "passenger"? After some time of reflection to help the children and lead them on the right path to the solution, which looks like this:

1. Insert the wrapped egg in a paper cup
2. Close the opening of the paper cup by adhesive tape with cardboard (or a second paper cup).
3. At the sides and fix (not complete) inflated balloons easily at the bottom of the cup. Moreover, even straws can be added as a "land legs".(About 40 cm diameter) This from a trash bag cut a circle in the middle of the circle a hole cut (5 -10 cm diameter) that stabilizes the descent:
4. Now only the parachute is missing. attach four equally long lines on the outer edge of the parachute and even against the "capsule" adhesive tape.
5. Then it goes into the stairwell where the landings take place.

Ask the children to open up the lander after falling from a story building. Ask if was a successful landing (If the egg is still intact and not broken- Successful, if not-Unsuccessful repeat experiment)

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ASTRONAUTS EXERCISE: Everything is difficult at once

How does it feel well after half a year in space and you are suddenly exposed to gravity again? Come the children themselves to the idea of how this can be modeled?

A simple method, which can simulate at least a little is the "piggy-running" with another Child on her back. So the students can simulate the unusual strength of gravity.

And remember: you cannot get up so easily, that is why the freshly landed astronauts are helped to exit from the capsule.