

# A Space Expedition Teacher's guide



A project for early education

## Space in kindergarten and early education

What is a spaceship? Where can we go? Let's see if we can find out!

As children, most of us probably went on a journey to space, in a cardboard box. What is more thrilling for a child, than an adult who sees them and joins in their play? In this set of activities, created by Andøya Space Education, children and adults can embark on this exciting journey through space together. Every topic and activity can be used individually or as a part of a large (or small) project about space. Allow the children to take part in planning the project, choose activities that suits your needs and create an exciting project together.

This type of play is valuable for childrens curiosity and wonder, and it is important that the adults participate in this play and encourage the children to ask questions. The curriculum for early learners in Norway state that «the kindergarten will facilitate for the child to stay curious about scientific phenomena...” To accommodate this curiosity and to be able to ask good questions, it is important that the adults have a certain knowledge about the topics. We are not expecting every adult who work with children to become experts on space, but to learn enough to be able to help the children in their need to explore.

Space is infinitely big, which results in it being an infinite source of knowledge. The future will need scientists who are curious and want to know more. These scientists are the children we raise today. It is you, who work with these children, who can influence the most how they think when they arrive out in the big world. Our mission is not only to fill their heads and minds with knowledge, but to teach them how to be independent beings with the need to explore and power to reflect.

In the activities attached we will try to imagine how such a journey might fare. Build your spaceship out of whatever materials you have, put on your spacesuit- don't forget the helmet- and embark on an amazing journey!

Happy travelling!

## Curriculum (Norwegian Rammeplan for early education)

The primary goal of the kindergarten is to promote learning. In the kindergarten, the children will experience a stimulating environment that supports their desire to play, explore, learn and master (...).

The children's curiosity, creativity and desire for knowledge should be recognized, stimulated, and create a foundation for their learning processes.

The children should examine, discover, and understand relationships, expand their perspectives and gain new insights.

| The children will   | The staff will  |
|---|---|
| <ul style="list-style-type: none"> <li>• Experience, explore and experiment with natural phenomena and physical laws</li> <li>• Construct from different materials and explore the possibilities of tools and technology</li> <li>• Discover and wonder about mathematical relationships</li> <li>• Develop an understanding of basic mathematical concepts</li> <li>• Experience sizes in their surroundings and compare them</li> <li>• Use their body and senses to develop a concept of space</li> <li>• Examine and experience how to solve mathematical problems and experiencing a joy of using mathematics</li> <li>• Explore and wonder about existential, ethical and philosophical questions</li> <li>• Through interaction, dialogue, play and exploration, the kindergarten will help the children develop critical thinking, ethical judgement, ability to resist and ability to react, so they can contribute to change</li> </ul> | <ul style="list-style-type: none"> <li>• Observe, analyze, support, participate and enrich the game on the children's premises</li> <li>• Be aware and evaluate their own role and participation in children's play</li> <li>• Make natural phenomena visible and reflect together with the children about relationships in nature</li> <li>• Explore and experiment with technology and natural phenomena with the children</li> <li>• Use mathematical concepts actively in a reflected manner in everyday life</li> <li>• Strengthen children's curiosity, mathematical joy and interest in mathematical relationships based on the children's own expressions</li> <li>• Facilitate mathematical experiences by enriching children's play and everyday life with mathematical ideas and in-depth discussions</li> <li>• Stimulate and support children's ability and endurance in problem solving</li> <li>• Challenge your children's thinking and invite them into exploratory conversations</li> </ul> |

## Content

|  |   |
|--|---|
| Space in kindergarten and early education .....            | 1 |
| Curriculum (Norwegian Rammeplan for early education) ..... | 2 |
| Facts about spacecrafts.....                               | 4 |
| Activity 1: Build a spaceship .....                        | 5 |
| Activity 2: Build a spaceship 2 .....                      | 6 |
| Where do we go now? .....                                  | 7 |
| Sources .....  | 8 |

## Facts about spacecrafts

We will not be using much time on differentiating between different types of spaceships in this activity. The expression can be used on different types of spacecrafts, that can be manned or unmanned, but we expect that children think of spaceships as manned craft that we can travel through space in. Children's images of spaceships will probably look more like something out of a Science fiction movie, than what is really is.



*Image credit: NASA*

Let's take a short look at the history of manned spacecrafts. The first person in space was Juri Gagarin in 1961. His spacecraft looked almost like a sphere.

In the following years humans had many short trips into space or were sent into orbit.

In 1969 the first humans landed on the moon. Neil Armstrong and Buzz Aldrin landed in the Apollo 11 Lunar Module, which had a very strange, angular look.

Since then there have been several people in space. This number increased dramatically with the dawn of the space shuttle in 1981. The shuttle was reusable, something that made space more accessible. The space shuttle was mostly used to put satellites or space telescopes into orbit, or for repairing other spacecrafts. The space shuttle was only used in Low Earth Orbit, about 320km. After retiring the space shuttle, there has been less human activity in space. Astronauts are brought to and from the international space station with Russian rockets, but no human has been outside Low Earth Orbit since.

Our big space organisations are now working to bring people further out into space than we have ever been. The great difference from the 70s and 80s is that many nationalities are working together on this project. They assume that we will be able to send humans to Mars in the early 2030s. Perhaps, playing with spaceships in kindergarten is a preparation for future astronauts who will travel further that adults today can fathom.

## Activity 1: Build a spaceship

Encourage the children to build a spaceship. This is where we can be creative in materials. Use what is available; cardboard boxes, blocks, furniture, or other things that are available to you. If the weather allows, and the kindergarten has the tools, why not build an outdoor spaceship? Let the children take the lead and decide what the spaceship will look like, allow them to be creative. Ask questions while you work to make the children reflect on what parts a spaceship will need, what they are made of, and where to go.

- where is the engine?
- What drives the engine? What is the fuel?
- What is this part for?
- What is the spaceship built of?
- Where will you go?

Try to follow the conversations between the children, follow their thought and ask questions about what they say. Follow up with activities, songs, stories or other tasks that match the children's interest. Some of the children might be more interested what a spaceship "really" looks like, or the materials it is made of. Some might be more concerned with where they want to travel in the spaceship. Allow the children to decide where the space project will go next.

## Activity 2: Build a spaceship 2

Spaceships can be built in many ways and with many different materials. Gather things the children can use. This can be milk cartons, empty toilet paper rolls, egg cartons or other packaging.

Let the children draw their own spaceship. Ask questions before and during their work, to make them reflect on what they are doing. What do the children think the spaceship should look like? What are some of the functions of the ship? Make an exhibition.

Try to build the spaceships the children drew out of the gathered materials. Some might want to change things, and that should be ok. Everything is allowed but remember to reflect on why.

Hang the spaceships around the room and set the mood for continuing your space project.

## Where do we go now?

Space is a topic that interests most children, and hopefully this activity has triggered their curiosity to explore further.

Allow the interests of the children to decide how to continue the project.

- Will you travel through the solar system? To the sun or the other planets?
- Or will you travel to an entirely different galaxy?
- Can we go to the end of space? How big is space?
- Are you looking for life other places in space?
- Are you space scientists?
- Or space explorers?

Only the imagination sets the limits. Look at the set of resources from Andøya Space Education and create your own project about space.

Gathering time is a great way to allow the children to share their experiences. Make up stories or songs and pull space into the kindergarten. Create a nook where the children can sit and look at books or pictures about space. Maybe you can invite parents and families to an exhibition to see what you are working on?

Such a project is the perfect arena for using educational documentation in the kindergarten. Use assemblies or other gatherings to reflect and discuss what you have learned and what you want to do now.

[Teddynaut](#) has his own page where he answers questions about space related topics from children. Check him out.





## Sources

- This resource is created by Andøya Space Education for ESERO Norway.