

# Inventions For Space workshop guide



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**The aim of Little Inventors workshops is to allow students to express the far reaches of their imagination. To inspire students to think up and draw original, ingenious, funny, fantastical or perfectly practical invention ideas. There are no limits!**

The Little Inventors **Inventions for Space** challenge offers a fun way to learn about astronauts and life in space. Developed with the Natural Sciences and Engineering Research Council of Canada (NSERC) in collaboration with the Canadian Space Agency (CSA), Inventions for Space offer a truly unique chance to learn about **David Saint-Jacques**, the next Canadian astronaut to go to space in 2018 and his life on the International Space Station.

Students will be able to draw and submit their own inventions to appear on a dedicated Little Inventors online gallery, where they will be reviewed by the Little Inventors team, NSERC and the Canadian Space Agency! their idea might even be chosen as team favourite, turned into an animation or even made into a real object by one of our *Magnificent Makers*!

## ***Familiarise yourself with the resources available before the workshop***

*Start by downloading the challenge pack.*

### **Inventions for Space *Life of an Astronaut* presentation.**

Use this presentation on a whiteboard or computer to help you deliver the workshop. Try playing the video on slide 4 before your lesson.

### **The CSA files presentations**

We offer another two complementary PowerPoint presentations to offer further insights in the life of astronauts focusing on training and space travel.

### **Printed Materials**

#### ***Per student:***

3x Letter size Little Inventors drawing sheets (have some spare ones too!)

1x Diary of an astronaut activity sheet

***or***

1x Space Station Mind mapping activity sheet depending on activity delivered during the workshop!

## Running the workshop

This guide suggests how you might want to use the Little Inventors resources to run a structured workshop over a single or double lesson. Customizable and extended activities are also provided to enable all children to make the most of the workshop.

**The workshop is composed of 6 activities:**

1. 3,2,1 lift off!
2. The CSA files extensions
3. Diary of an Astronaut
4. Space Station Mind mMap
5. What's Your Invention?
6. Rounding up

The total time required to complete the following activities is from one hour but can be split across 3 lessons to cover the whole content available. You may want to deliver this as part of an existing scheme on space, or as a standalone. It's up to you!

### **Activity 1: 3, 2, 1, lift off!** (15-20 mins)

Explain that in this workshop, students will get to learn about the Canadian Space Agency, astronaut **David Saint-Jacques** and living in space. They will then get a chance to come up with an invention idea to make astronauts' lives better, easier or simply more fun!

Open the Inventions for Space *Life of an Astronaut presentation* and go through the slides with your class:

- Slides 1 and 2 sets the scene for the Little Inventors Inventions for Space challenge
- Slides 3 and 4 introduces Canadian astronaut David Saint-Jacques and CSA, with a **personal message** from David himself!
- Slides 5-6 focus on gravity, microgravity and why objects seem to float in space
- Slides 7-10 offer inspiration about specific aspects of living in space (eating, sleeping, exercising and relaxing), linking to relevant CSA webpages
- Slides 11-13 support the activity sheets
- Slide 14 encourages reflection on their invention idea
- Slides 15-17 offer extensions into the program

This PPT can be delivered as it is, while extra content is offered through links to the CSA website for extra information, facts and videos about life in space - make sure you explore these pages to make the most of the resources!

## Activity 2: The CSA files extensions

As well as our core Life of an Astronaut presentation, we also offer two informative presentations to complement the information and learning.

**Space travel** offers an insight into the Soyuz capsule, the International Space Station and space walking. **Astronaut training** explores what it takes to become an astronaut, looking specifically some of the core elements such as flight, survival, robotics and communications

Both presentations also include further avenues of investigation to encourage your students to consider the challenges involved and expand their thinking.

## Activity 3: Diary of an Astronaut (10-15 mins)

It's always helpful to put yourself in someone else's space shoes! Tell your students that this Diary of an Astronaut will help them understand what it is like to be an astronaut and think about a specific challenge of daily life in space.

Give children a *Diary of an Astronaut* activity sheet.

Ask them to imagine they are an astronaut in the International Space Station, and to describe a typical day, thinking about all the things they have learned about living in space.

They can start by drawing their face in the top to show their mood on this particular day (happy, sad, bored, excited, etc).

They can describe what they can imagine seeing from the ISS, for example, features on Earth, which could be linked to real life events (for example weather related events or a specific geographical element like mountains or the great wall of China).

Ask them to focus on one particular thing they have found tricky as part of their day in space and encourage them to add details to describe what the challenge is. Identifying a specific challenge is one way to help them come up with an invention idea to solve.

**Customization:** Instead of writing their description, students could do a drawing to represent their day in space.

**Extended activity:** You could ask your students to write a longer story, or draw a comic strip about their astronaut selves, and invent challenges they meet on their journey.

#### Activity 4: Space Station Mind Map (10-15 mins)

This **Space Station Mind Map** activity aims to encourage children to think about challenges of living in space in a little more depth in order to develop a better idea for an invention before drawing it.

*Give children a Space Station Mind Map activity sheet.*

- Ask them to write down words that come to their minds when thinking about eating, sleeping, exercising and relaxing in space. They can also add their own thoughts and words as they see fit!
- You might want to get children to work in pairs or small groups to share their ideas.
- You can help them by asking them to think about different questioning: what it is, where does it take place, when, who is involved, what happens, etc...
- Ask children to repeat the process with the words they have written down to create another layer of words.
- Ask them to explore words they have written down — what idea does it give them for an invention?

**Customization:** Get students to draw their space station with different units for sleeping, eating, exercising and having fun/ relaxing.

**Extended activity:** Ask students to think about a specific activity on earth that they would like to do in space - ask them to think about what the challenges would be and what they could do to make it work.

#### Activity 5: What's Your Invention? (20-40 mins)

Once students have had a chance to develop their ideas a little through the **Diary of an Astronaut** or the **Space Station Mind Map**, give them a **Little Inventors** drawing sheet to draw and explain their own invention.

*Students can draw more than one invention if they want.*

**Differentiation:** Students make a video or audio recording to explain how they got their idea in their own words.

**Extension activities:** Students come up with their own invention ideas, draw them and explain how they think it can work and how it can be made. Students could also make a model of their invention. Students can also create ads for their invention by designing leaflets or making a video.

### Activity 6: Round-up! (5-15 mins)

Gather all the student invention drawings in a gallery around the classroom/workspace.

Get students to discuss their favourite ideas – what do they like and why?

**Encourage positive feedback throughout.**

- What do they think of their invention?
- What are its strengths and weaknesses?
- How do they think their invention would work in orbit?
- Can they imagine astronauts using their inventions? What would they say?
- What other ideas or challenges can they think of?
- Why are inventions useful?
- How will they approach problems in the future?

Give children extra *Little Inventors* drawing sheets to come up with more invention ideas at home.

#### **After the workshop:**

Make sure you collect all Little Inventors drawing sheets during the workshop. Invention drawings should be scanned (rather than photographed) to be uploaded on [littleinventors.org/NSERC](https://littleinventors.org/NSERC) for a chance to get picked as *Little Inventors* team favourites, turned into animations or even get made into real objects!