



Educator's GUIDE

About the GUIDE



ABOUT THE NFB SPACE SCHOOL INTERACTIVE WEBSITE

NFB Space School is an educational interactive production that brings the wonders of the universe into your classroom. Teachers and students have the opportunity to observe and connect with the monumental six-month mission of Canadian astronaut Commander Chris Hadfield, the first Canadian commander of the International Space Station (ISS). **NFB Space School** is an interactive website divided into two modules—**Mission** and **Leadership**—each with its own focus, background information, context and set of enrichment activities to meet the needs of multiple types of learners.

The content of each module is divided into three responsive screens arranged horizontally across the page. The central screen contains NFB-produced original content, featuring Chris Hadfield and **NFB Space School** host Jeremie Saunders, alongside the characters they encounter. Clicking on one of the adjoining side screens opens a larger view, allowing the user to shift their visual focus while continuing to listen to content from the central screen.

Below the central screen, in a navigation bar, the various chapters of the **Leadership** module (A through J) are displayed, complete with brief pop-up text descriptions of each chapter's content.

The left-hand screen features infographics and archival personal images enhancing the themes and ideas Hadfield discusses in the lesson videos. Images range from short biographical video clips to old family photos and inspirational images of Hadfield's mentors and heroes. The right-hand screen features archival film and photographic imagery of Hadfield's journey to become an astronaut (working with a team, training to be a test pilot, etc.) By enlarging and moving between screens while listening to Hadfield speak, users may pilot their own experience, keeping them engaged in the primary interview content.

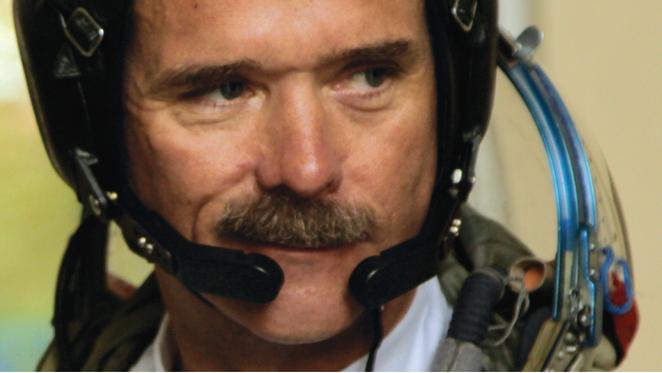
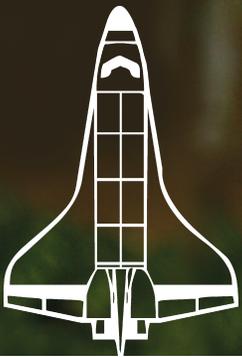




ABOUT THIS GUIDE

This educator's guide is intended to assist junior and secondary school educators as they incorporate NFB digital technologies and mobile applications into their classrooms. **NFB Space School** will encourage students to engage with Chris Hadfield's mission as the first Canadian commander of the ISS; allow them to learn more about the history and science of space travel; and inspire them to investigate and pursue their own personal goals and dreams. The suggested activities are designed to engage students at a variety of levels and appeal to a wide range of learning styles.

Some activities are directly related to the ISS and Chris Hadfield's mission, while others investigate more abstract topics such as qualities of leadership. For example, in the **General Classroom Activities** section, some of the music activities examine how Hadfield's love of music has broken down boundaries and has been used as a leadership tool to raise people's interest in the space program. The **Media Literacy Activities** section presents educators with several projects designed for various ages, interests and abilities. In the **Additional Resources** section, educators will find links to additional NFB projects of interest, free online tools, traditional library resources and social media links, all of which provide enrichment opportunities beyond the **NFB Space School** website.



It is hoped that the content on **NFB Space School** and this support guide will strengthen ties to curriculum, as well as encourage students and teachers to expand their ideas about what can be achieved within classroom learning. The NFB encourages the integration of new technologies in the classroom, and this guide is designed to help students and teachers utilize the **NFB Space School** website and its resources to their full educational potential.



RECOMMENDED AGE LEVELS

Educators are always strongly encouraged to preview media content before presenting it to their students. However, **NFB Space School** is designed to be suitable for learners of all ages, with the intended school-aged audience being students between the ages of 11 and 15. Some activities and content within this guide will appeal to all students in this age range, while others are targeted at students of certain ages. There is enough flexibility within each of the activities to modify them and their learning outcomes so that they are meaningful to every participating student.

RECOMMENDED SUBJECT AREAS

SOCIAL STUDIES | LANGUAGE ARTS | ENGLISH LANGUAGE ARTS | FRENCH LANGUAGE ARTS
SCIENCE | ART | MUSIC | PHYSICAL EDUCATION | MEDIA LITERACY | FAMILY STUDIES | CIVICS

As the title suggests, the **Leadership** module focuses specifically on the social implications of the International Space Program rather than the science of space travel. Science teachers will certainly find relevant curriculum support in the **Mission** module, but may also choose to spend time with the historical and motivational sections of the **Leadership** module as enrichment.

KEY THEMES AND CONCEPTS

As is suggested by the chapter titles, the short lessons that make up the **Leadership** module are designed to inspire students. Recognizing that not everyone can become an astronaut, the lessons focus on inspiring and encouraging students to embrace their dreams without worrying about peer pressure.

Through a discussion of his own adolescence, ISS Commander Chris Hadfield shares his belief that forming goals, finding mentors, breaking away from peer pressure and knowing one's own mind are the secrets to success in life. One key concept Hadfield communicates in this module is to "dare to dream and work hard to achieve it."

Additional key concepts found within the **Leadership** module include:

- Self-reliance
- Self-discipline
- The importance of forming goals
- Planning to achieve goals in small steps
- Establishing a support network
- Identifying attainable goals
- Learning something from everyone one meets
- The importance of initiative and original thought
- Understanding that our actions create our lives
- The importance of curiosity
- The value of service
- Canadian citizenship



ABOUT THE LEADERSHIP MODULE

NFB Space School's Leadership module is presented as a series of 10 short video interviews (chapters) with Chris Hadfield. Each of these videos has a unique theme that prepares teachers for various curriculum links as well as outreach activities.

A synopsis of each chapter can be found in the next section of this guide. The chapters are designed to stand alone and to be used selectively. They can also be viewed sequentially or divided between groups of students for individual, group or seminar work.

Following the completion of each chapter, teachers have the option to click on the **Teach It** link, which will reveal icons linking to **Learn More** and a **Quiz**. The **Learn More** function opens up a variety of online links and useful resources. The **Quiz** section provides a multiple-choice quiz testing how much students have learned while exploring the **Leadership** module. Students are encouraged to take the **Quiz** following each lesson.



CONTEXT: Important Background Information



In the course of the 10 **Leadership** lessons, Chris Hadfield focuses on mentors and people who have influenced him. His list is very diverse and includes his father, Roger Hadfield, alongside test pilot Chuck Yeager and astronaut Neil Armstrong. As a reference, here are brief biographies of Chris Hadfield, Neil Armstrong and Chuck Yeager, as well as some information about the International Space Station.



CHRIS HADFIELD

Chris Hadfield was born on August 29, 1959, in Sarnia, Ontario, and was raised in Ontario. After receiving a bachelor's degree in mechanical engineering at Royal Military College in 1982, he trained as a fighter pilot before enrolling at the University of Tennessee where he graduated with a Master of Science degree in aviation systems in 1992. He attended the United States Air Force (USAF) Test Pilot School at Edwards Air Force Base in California and, after graduating, served as an exchange officer with the U.S. Navy, where he did research work with NASA on pitch control margin simulation and flight. He was the pilot who completed the first military flight of F/A-18 enhanced-performance engines and also piloted the first flight test of the National Aerospace Plane external-burning hydrogen-propulsion engine.

Hadfield worked for the military in a variety of capacities until June 1992 when he was selected to become one of four new Canadian astronauts from over 5,330 applicants. The Canadian Space Agency (CSA) assigned him to work at the NASA Johnson Space Center in Houston, Texas, in August of the same year. While working there, he addressed technical and safety issues for Shuttle Operations Development, contributed to the development of the glass shuttle cockpit, and aided with shuttle launches at the Kennedy Space Center in Florida. In addition, Hadfield was NASA's Chief CapCom, the voice of mission control for astronauts in orbit, for 25 space shuttle missions.



In November 1995, Hadfield served as Mission Specialist 1 on **STS-74**, NASA's second space shuttle mission that met and docked with the Russian Space Station Mir. Hadfield flew as the first Canadian mission specialist, and the first Canadian to operate the Canadarm in orbit, and he remains the only Canadian to ever board Mir.

From 2001 to 2003, Hadfield was the Director of Operations for NASA at the Yuri Gagarin Cosmonaut Training Centre in Russia. His work included the direction of all International Space Station crew activities in Russia, managing training and crew support staff, as well as policy negotiation with the Russian Space Program and other International Partners. During this period, he also served as Mission Specialist 1 on **STS-100** International Space Station (ISS) assembly Flight 6A. As part of the 11-day flight in April 2001, Hadfield took two spacewalks, which made him the first Canadian to ever float freely in space. Hadfield retired as a Colonel from the Canadian Air Force in 2003 after 25 years of military service. He was Chief of Robotics for the NASA Astronaut Office at the Johnson Space Center in Houston from 2003 to 2006, and was Chief of International Space Station Operations there between 2006 and 2008.

Hadfield continued to work for the ISS on a variety of assignments until September 2010, when he was assigned to **Expedition 34/35**. On December 19, 2012, he joined the Russian *Soyuz*, becoming the second Canadian to take part in a long-duration spaceflight aboard the ISS. On March 13, 2013, he became the first Canadian to command the ISS during the second portion of his five-month stay in space. On May 13, 2013, Hadfield, Tom Marshburn and Roman Romanenko landed in Kazakhstan after living for 146 days in space, 144 of which were spent aboard the station. During his long career, Hadfield has received many accolades including induction into Canada's Aviation Hall of Fame in 2005 and being commemorated on Royal Canadian Mint silver and gold coins for his spacewalk to install Canadarm2 on the International Space Station in 2006.

In June 2013, Hadfield announced his retirement from the CSA as of July 4, 2013. He has not yet said what he will do next—other than seek new challenges.¹⁻²

¹NASA biography of Chris Hadfield: http://www.nasa.gov/pdf/64090main_ffs_bio_hadfield.pdf

²Canadian Space Agency biography of Chris Hadfield: <http://www.asc-csa.gc.ca/eng/astronauts/biohadfield.asp>



NEIL ARMSTRONG

Neil A. Armstrong was the first man to walk on the moon. He was born in Ohio on August 5, 1930. After a career as a naval aviator, Armstrong joined the National Advisory Committee for Aeronautics in 1955 where he worked as an engineer, test pilot, astronaut and administrator. He continued to work for several years as a test pilot for NASA before becoming an astronaut in 1962. He was the command pilot for the Gemini 8 mission that was launched on March 16, 1966. During this mission, Armstrong performed the first successful docking of two vehicles in space.

As the commander of Apollo 11, the first manned lunar landing mission, Armstrong was the first man to land on the moon and step on its surface. For this achievement, Armstrong received medals from 17 different countries. He died on August 25, 2012, of cardiovascular complications at the age of 82.³

CHUCK YEAGER

Chuck Yeager was born in 1923 in West Virginia, where he later joined the U.S. Army Air Corps to serve in World War II immediately after graduating from high school. After the war ended, he served in the U.S. Air Force as a flight instructor and a test pilot. On October 14, 1947, he broke the sound barrier, a record that he broke again in 1952 when he set a new speed record of 1,650 MPH, more than twice the speed of sound. After the beginning of the Space Race in 1956, Yeager commanded the Air Force Aerospace Research Pilots School to train pilots to qualify for the space program.⁴

In 1960, Yeager was named director of the Space School at Edwards Air Force Base. He was very involved in the creation of spaceflight simulators and instructing pilots on how to use onboard computers.⁵

Yeager never went into space himself, but nearly half of the astronauts recruited for the Gemini, Mercury and Apollo programs were graduates of his school. Yeager gained widespread fame through the publication of Tom Wolfe's book *The Right Stuff* (1979), describing the early days of the space program and Yeager's contribution to it.⁶⁻⁷

THE INTERNATIONAL SPACE STATION (ISS)

The ISS program is a joint project among five participating space agencies: the Canadian Space Agency, NASA, the Russian Federal Space Agency, the Japan Aerospace Exploration Agency and the European Space Agency. The ownership and use of the space station is established by intergovernmental treaties and agreements. The station is divided into two sections: the Russian orbital segment (ROS) and the United States orbital segment (USOS) which is shared by many nations. Hadfield takes viewers on a tour of both sections in the **Mission** module of **NFB Space School**.

The ISS is a habitable artificial satellite in low Earth orbit. Now the largest artificial body in orbit, it can often be seen at the appropriate time with the naked eye from Earth. The ISS serves as a microgravity and space environment research laboratory in which crew members conduct experiments in biology, physics, astronomy, meteorology and other fields. The station is suited for the testing of spacecraft systems and equipment required for missions to the Moon and Mars.

³ Glenn Research Center, NASA, biography of Neil A. Armstrong: <http://www.nasa.gov/centers/glenn/about/bios/neilabio.html>

⁴ Academy of Achievement biography of Chuck Yeager: <http://www.achievement.org/autodoc/page/yea0bio-1>

⁵ NASA history homepage biography of Charles (Chuck) Yeager: <http://www.hq.nasa.gov/office/pao/History/x1/chuck.html>

⁶ Academy of Achievement biography of Chuck Yeager: <http://www.achievement.org/autodoc/page/yea0bio-1>

⁷ NASA history homepage biography of Charles (Chuck) Yeager: <http://www.hq.nasa.gov/office/pao/History/x1/chuck.html>



In each of the module's 10 chapters, Chris Hadfield discusses aspects of his journey to become an astronaut. The videos range from approximately one to three minutes in length.

INTRODUCTION

Introducing Astronaut Chris Hadfield, the first Canadian commander of the ISS.

Hadfield introduces himself to the audience by listing all of the jobs he has held in his life, and by describing how each of these acted as a stepping stone to him becoming an astronaut. He tells the audience that he has taken two previous journeys into space before his six-month stay on the ISS as Commander. He states his belief that “no matter what you do with your life, everything has a cost,” prior to outlining some of the demands of his job (such as frequent travel and constant study). Other notable quotations include: “the things you do don’t affect your life—they are your life” and “it’s not my job to be an astronaut; I am an astronaut.”

DREAMER

What you can accomplish when you pursue your dreams.

Hadfield decided to become an astronaut at the age of nine when he learned of Neil Armstrong becoming the first person to walk on the moon. He states, “To me it was the most exciting thing in the universe... that people were leaving the planet and walking on another one.” We learn that he was born in Sarnia, Ontario, then moved to a farm near Toronto when he was eight or nine years old. He describes how his curiosity began early in life: “As a kid, I was always lost in my thoughts, trying to figure out how things work... trying to understand my place in it all, trying to get better at things.” Hadfield also speaks about peer pressure and his own personal challenges. He tells the audience that his parents wanted him to pursue his dreams, but that they also knew it was important to have something practical to fall back on. The lesson finishes with Hadfield joking that his parents didn’t have a lot to worry about.



STUDENT

No matter how much you know, everyone you meet can teach you something new.

In this chapter, Hadfield outlines his belief that we can learn from every person we meet in life and that it is important to discover what it is that each person can teach you, as quickly as possible. This section ends with a story about one of Hadfield's high school math teachers who taught Hadfield that everything has a practical application and that math could be used to solve problems that were otherwise unsolvable.

CADET

Self-discipline can help you become whatever you want to be.

Hadfield explains that even though he wanted to be an astronaut from a very young age, he realized he could not become one overnight and looked for ways to work toward his goal. He learned how to fly gliders in the Air Cadets and became a glider pilot when he was 16. Hadfield describes how he learned self-discipline at this age and began to understand the necessity of working as a part of a disciplined team of people. He also discusses how any group that is trying to achieve complex goals needs a leader to assume responsibility.

CANADIAN

Travel abroad can provide valuable insight into life at home.

In this chapter, Hadfield discusses his identity as a Canadian citizen and his belief that it is necessary to serve the society of which one is a member. He reflects that it takes a great deal of work to create the culture of a country. He describes travelling to Europe for six months after finishing high school to give himself some time to decide what to do with his life. He explains how his exposure to the great and established history of Europe showed him the value of service and building great societies. During this time, Hadfield decided that training as a test pilot could help him fulfill his dream of becoming an astronaut. In summary, Hadfield emphasizes how taking this time to consider his options helped him to develop his framework of values.



TEST PILOT

In pursuit of a dream, be prepared for the many challenges that await.

Hadfield admits that almost no one knows what a test pilot is or what he or she does. As a student, he wrote letters to test pilots and asked them about their work, whether they liked doing it and how much money they made. At the time, he was still deciding whether to become an engineer, test pilot or astronaut. He believed that he could easily end up working as a test pilot and not an astronaut. He attended test pilot school at Edwards Air Force Base, which is the site where Chuck Yeager broke the speed of sound. He describes the year he spent on exchange at the U.S. Air Force base as being extremely hard and competitive. For Hadfield, this job had everything he loved—flying, solving problems and figuring out how complicated things work—so he realized he would have been happy with a career as a test pilot had he been unable to transition into a career as an astronaut.

SEEKER

There is value to a curious mind and an adventurous soul.

Hadfield discusses relationships and the importance of working with good people. He reflects that when one is a long, long way away from home in a very small place, one wants to be with interesting people. (He confides that if you're going to have dinner 140 times with the same three people, you really want them to be people who have depth of thought and lots of good stories to tell!) He believes that good astronauts think about art, music, the beauty of the Earth and where we are in our collective history. Most astronauts, he says, have done many different things along their career path, and most have reserved personalities, which is important since loud, boisterous people do not work very well in space. He expresses his hope that he has had enough experiences to be a good crewmember and commander.

CONTENDER

Dreams remain dreams unless you seize your opportunities.

Hadfield recounts the story of his successful efforts to become an astronaut. When he was 32, there was an ad in the newspaper stating Canada needed astronauts. The requirements began with a university degree, Canadian citizenship and the ability to pass the physical exam. He realized that the time he had waited for his whole life had finally arrived. He describes his rigorous application process and how he looked into every detail, from the type of paper he printed his resume on to finding the fastest courier to deliver his application. He finally received a letter stating that he had made the first cut and that the number of applicants had been reduced from the original 5,000 to 500. Next, he took the psychological exam before graduating to interviews and medical testing. Finally, he describes the life-changing moment when he received a call from the president of the selection committee to tell him that he had been selected to train as an astronaut.



ASTRONAUT

Being a successful leader is committing to a life of learning.

This chapter explains the rigour involved in becoming an astronaut. Hadfield says that the job of an astronaut is a lonely one. In space, essential survival skills are represented by a small group of people. ISS staff members have to be able to fix and clean everything from toilets to technical equipment, as well as have the capability to conduct scientific experiments. They have to understand every function and process of life aboard the ISS. Hadfield reveals that it took him 20 years to have enough training to prepare him for life in space.

CONCLUSION

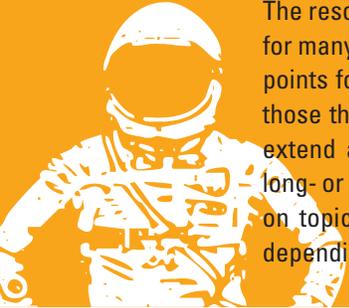
The best way to predict the future is to create it, step by step.

In the final chapter of the **Leadership** module, Hadfield asks viewers to contemplate what they are going to do with their lives, offering encouragement to consider thinking about what excites them in order to begin pursuing it. He asks viewers to ask themselves, "What would be a great thing to become and how can I become that?" He reminds viewers (especially young people) that the decisions they make today will shape their futures and that they can achieve their goals by working at them bit by bit.





TEACHER PREPARATION: CLASSROOM ACTIVITIES



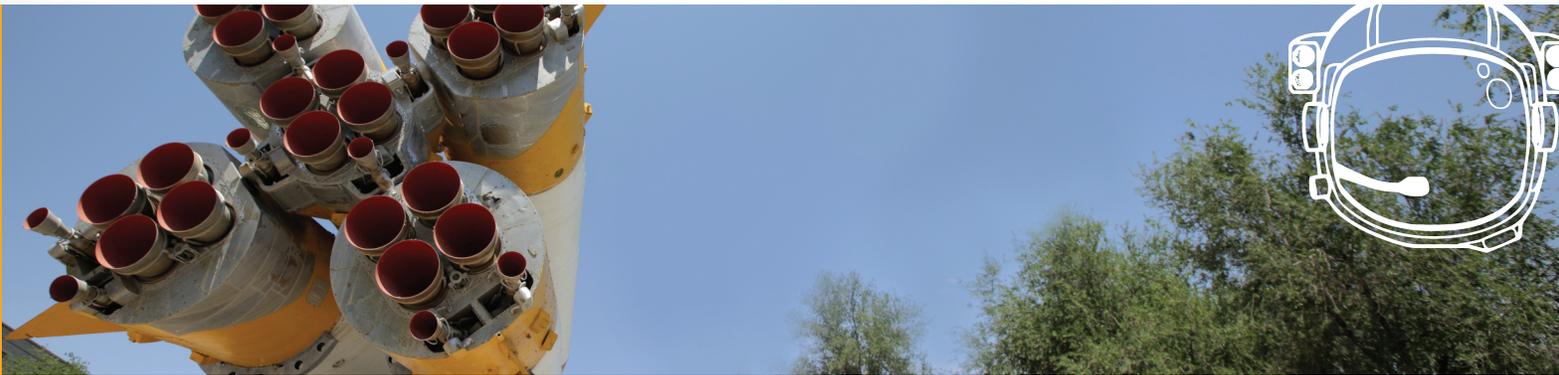
The resources that can be found under the auspices of **NFB Space School** are open-ended and suitable for many applications and a diversity of learning environments. Each of the 10 Lessons provides starting points for a range of activities, ranging from those that are closely related to curriculum outcomes to those that can serve as springboards for class discussions or project work. Educators may choose to extend any of these general activities or the media literacy activities in the following section into long- or medium-term projects based on **Leadership** module material. Single-day activities or discussions on topics such as self-esteem, goal setting and peer pressure are good fits and can be extended depending on available time and class interest.





DISCUSSION QUESTIONS ABOUT LEADERSHIP

The following are suggested questions to be discussed with your students before and after screening various lessons from the **Leadership** module.



... 1 ...

What types of people do we usually identify as leaders? What do they have in common?

... 2 ...

What qualities do you look for in a leader? What attributes should leaders have?

... 3 ...

How are leaders presented in media? What types of people does the media posit as leaders?

... 4 ...

Are there differences between the leaders you find online or in movies and those you have picked in your own lives?

... 5 ...

Identifying leaders involves value judgments. Why might one person think someone is a leader, while another person might think differently of the same individual?

... 6 ...

Are all leaders dependable? How do we feel when leaders let us down?

... 7 ...

Do you consider Chris Hadfield a leader? Why or why not?
Please point to specific examples from the **Leadership** lesson videos.

ACTIVITY 1

General Classroom

ACTIVITIES



DEFINING A LEADER

During each of the lessons in the **Leadership** module of **NFB Space School**, Chris Hadfield considers several different life experiences that have taught him the qualities necessary for **leadership**. This exercise gives students the opportunity to explore some of these issues in individual or group settings.

Age range 11 to 16

Time needed: 3 to 4 hours (45 minutes of class discussion; 2 to 3.25 hours for presentation preparation).

Subject area links: Language Arts, English, Civics, Social Studies, Science.

Learning outcome(s): Students will be able to identify qualities of a strong leader and communicate them on a poster board, or through an oral or digital slide presentation.

Materials needed: Access to the Internet and/or a library; a computer with PowerPoint or Keynote; poster board and poster materials.

Description and steps for this activity:

1. This exercise could be done as a class activity or in small groups. Students could begin this activity after considering the discussion questions above.
2. Students should be able to describe the qualities of a good leader once they have engaged with the discussion questions. These qualities can be presented in a list on a poster, paragraph, oral presentation introduction or digital slideshow.
3. Students will then choose someone who reflects these qualities. The person can be a family member, friend, coach or public figure. Students should describe how this person embodies the qualities of a leader. Some biographical information and/or personal reflections should make this connection clear. The final project should be presented in an agreed-upon format (i.e., digital slideshow, poster board, etc.).
4. Depth of insights and technical proficiency expectations for this project are dependent on the age, ability and interest level of students.



GOAL-SETTING EXERCISE

Chris Hadfield frequently mentions that he began to set goals for himself at a very young age. He stresses that large goals are only achieved via a series of small steps and small decisions. He also believes that it is very important not to get tied to a particular outcome and to understand that very interesting things occur when we set goals even if we do not always succeed at them. This simple activity will encourage students to set goals of their own.

Age range 11 to 16

Students of all target ages can form and articulate goals. Expectations may have to be modified for younger students.

Time needed: 1 to 2 hours.

Subject area links: Social Studies, Civics, Language Arts, English, PE.

Learning outcome(s): Students will begin to understand how to formulate goals in a systematic way.

Materials needed: Writing materials, access to the Internet (to research qualifications).

Description and steps for this activity:

1. After watching the **Leadership** lessons (and specifically Lessons A, B and H, in which Hadfield describes how he set goals for himself at a very young age), students will have no trouble imagining some goals for themselves.
2. Students can begin by discussing their future “ideal selves” in small groups. They can discuss what kind of job or experiences they would like to have in the future. It might even be important for them to define what the “future” means for them. Have them consider the timelines for their goals and whether there are differences between long-term and short-term goals.
3. After narrowing down some of their goals, students can begin to write about them, describing why they have these goals and how they imagine achieving them would change/impact their lives. They should identify differences in these processes between long- and short-term goals.
4. Students can present their goals orally, as a digital slideshow, on a poster or in a short paragraph. The presentation format chosen will depend on available materials and time dedicated to the activity.

ACTIVITY 3

General Classroom

ACTIVITIES



HOW CAN WE ACHIEVE OUR GOALS IN LIFE?

In many of the lesson chapters, Chris Hadfield discusses different methods that he used to achieve his life goals. This exercise is designed to help students identify and achieve goals in an individual or group setting.

Age range 11 to 16

Time needed: 1 hour to discuss how to achieve goals. Should students wish to go into more depth by contacting professionals who work in their ideal field, more time may be allotted. (Up to a week from assignment to completion may be necessary.)

Subject area links: Social Studies, Civics, Language Arts, English, Science.

Learning outcome(s): Students will understand that setting goals takes planning. Students may have contact with people working in careers of interest. Students can express some of the steps necessary to achieving their goals.

Materials needed: Depending on the presentation format, students will need access to Internet, visual materials and communication tools such as telephones, e-mail and social media accounts.

Description and steps for this activity:

1. If students have already done Activity 2 (Goal-Setting Exercise), they are halfway there. If they have not, consider completing that assignment before attempting this activity.
2. Students can begin brainstorming general ways of achieving goals as a class or in small groups.
3. Students can work individually to write up a draft plan of the steps necessary to achieving their goals. If students are having difficulty imagining how they can achieve their goals, teachers can discuss a time when they formed a goal and outline the steps they followed to achieve it. Alternately, teachers could come up with a real-world problem such as, "If you wanted to get an A on your Social Studies project, what steps would you take?" or "If you wanted to redecorate your bedroom, how would you begin?" This introductory exercise could be done orally with the whole class.
4. Students can contact people in the community who work in the field they hope to pursue and ask them for advice about how they achieved their goal. The person could be a friend of the family or relative. If this is too difficult or if there are time constraints, students can use online resources to find more information about the training and qualifications necessary to work at their ideal job. If the goal is harder to attain than most—such as becoming an astronaut or movie star—students may want to broaden their searches to communicate with adults in their community including local politicians, athletic coaches, teachers or other adult role models to seek their advice and reminiscences about how they achieved their goals.
5. After consulting with professionals, students can write a revised goal-achievement plan.
6. Students can present their findings in a variety of formats.



ACHIEVING THE IMPOSSIBLE (DISCUSSION)

Chris Hadfield understands that he is in a very fortunate position, being one of the most well-known astronauts in Canada. Acknowledging this, Hadfield points out that every mentor or famous person is nonetheless essentially no different than anyone else. They are people who have worked very hard to achieve their goals. Hadfield reminds students that he did not come from a wealthy or privileged background, and that—through a combination of skill, hard work and luck—he achieved his dream. This exercise is designed to remind students that many very successful people have had to overcome great odds to find success.

Age range 11 to 16

Sophistication of the discussion will depend on the needs, level and maturity of the group.

Time needed: 1 to 3 hours. One class could be spent introducing and discussing the topic. Presentation of research by students is an option and would take at least one extra class.

Subject area links: English, Language Arts, Civics, Social Studies, Science, PE.

Learning outcome(s): Students can put their own goals into context and realize that achieving goals takes a combination of planning, hard work and luck.

Materials needed: Teachers may search online for videos/supplementary materials about someone who overcame great odds to succeed in their goals.

Description and steps for this activity:

1. Teachers can introduce the topic by listing or discussing people who overcame great difficulties to achieve a goal that may have seemed unreachable at first. There are many examples of successful people from all countries, fields and walks of life. Examples range widely: Martin Luther King, Jr., Helen Keller, Bob Marley, Nelson Mandela, Oprah Winfrey, Clara Hughes, Ellen DeGeneres, Taylor Swift, Spencer James West, Jennifer Lawrence, etc.

2. Ask students if they know anyone—someone famous or someone they have met—who has overcome great odds to achieve their goals. If they do not know anyone personally, guide the discussion to ask them if they have read about anyone or seen anyone profiled on television that fits this description. The teacher can describe some of the hardships certain leaders have gone through as a way of revisiting the qualities of **Leadership** that the class has agreed upon. This could take the form of a class discussion.

3. Students will be encouraged to undertake research on a person who overcame great odds to achieve their goals.

4. Students can present this information in a variety of formats (oral presentation, poster, website, digital slideshow). Students should be encouraged to focus on lessons learned from their chosen subject and to identify certain character traits their subjects identify as assisting them with their success.



PROBLEM-SOLVING WITH A GROUP

Throughout the lessons in the **Leadership** module of **NFB Space School**, Hadfield stresses the importance of working within a team of dedicated individuals to achieve common goals. This activity is designed to give students the opportunity to solve a problem in a group setting. The difficulty of the task and the resources used are dependent on age, interest and availability.

Age range 11 to 16

Activities can be designed to fit the needs and abilities of the group.

Time needed: 1 to 2 hours, depending on the complexity of the task(s).

Subject area links: PE, Civics, Social Studies, Science, Language Arts, English.

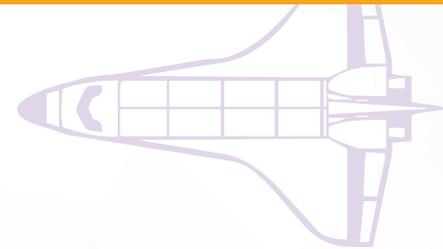
Learning outcome(s): Students will understand the importance of working as a team and dividing up tasks.

Materials needed: This is dependent on the group activity, which could range from students working together to complete a puzzle or to find items in a scavenger hunt, to something more difficult such as fixing, building or designing something within the ability level of the students (i.e., design a cruelty-free mousetrap in a group setting and draw and label a picture of this invention). Students can also work together to come up with solutions to ongoing, smaller, but very relevant problems in their own schools (i.e., where to put their winter boots so they do not make a mess in the classroom).

Description and steps for this activity:

This depends completely on the specific activity. Ideally, the assignment will involve group dynamics, group decision making and group process.

1. Remind students that, as Hadfield says, an astronaut is their own hospital and 911 call centre. With this in mind, the teacher can ask which qualities make someone a good candidate to work within a group.
2. Students should then be given a problem to solve in a group setting. (See "Materials needed," above.) Teachers should ensure that the activity not be conducive to a strong leader dictating the actions of all other people in the group.
3. Students can present their results in a variety of ways: dynamic presentation, video, digital slideshow, etc. Students could tweet their progress to classmates using Twitter.





LEADERSHIP AND THE SPACE RACE

Teachers can find a wealth of material about the history of the Space Race in print and online. Students should find Chris Hadfield's personal reminiscences about his history as a fighter pilot searching for Soviets fascinating in light of his collaborative role as a leader of Russian and other international astronauts at the ISS. Useful websites include TheSpaceRace.com, History.com and NASA.gov. A great deal of project work could be done related to the politics of the Space Race. Stress to students that in the late 1950s and 1960s, many people thought that the nation that won the Space Race would lead the world.⁸ By the late 1950s, the idea of space travel became a real possibility as Russia and the United States engaged in the race to be the first nation to land on the Moon. The Russians took the lead with the first artificial satellite flight in October 1957. This early successful orbiting of the Earth in the Sputnik satellite caught the Americans off-guard and began the Space Race in earnest.⁹ Despite the early lead taken by the Soviet Union, the American-led 1969 mission Apollo 11 was the first successful Moon launch, with Neil Armstrong becoming the first person to walk on the Moon.

Age range 13 to 16

Time needed: 1 hour for discussion and introduction of the topic, 1 to 2 extra hours if videos are shown and 2 hours of class time for each of the exploratory options listed below.

Subject area links: Language Arts, English, French, Social Studies, Civics, Science.

Learning outcome(s): Students will understand that space exploration has not always been as internationally collaborative as it is today. Students will gain introductory understanding of the politics involved in the Space Race.

Materials needed: Access to computers and the Internet, media player and a class Twitter account if the interactive extension is chosen.

Useful sources of video about the Space Race include:

- *Space Race*, a 2005 BBC DocuDrama series;
- *this list* of five films that explore the Space Race.

Teachers may choose to engage in some of the media literacy activities and discussion questions (in the Media Literacy Activities section, below) with students before showing them any of these films.

⁸ http://www.nasa.gov/offices/oce/appel/ask/issues/42/42s_leading_race_to_space.html

⁹ history.nasa.gov/sputnik/ and www.russianspaceweb.com/sputnik.html



LEADERSHIP AND THE SPACE RACE (*cont'd*)

Description and steps for this activity:

Each of the following mini-activities can be tackled on their own, or they can all be undertaken dependent on the students' interest and the time available in the curriculum.

1. **Research assignment/media literacy:** Using online sources or traditional media, students can look for reports from the early days of the Space Race. They may want to read local Canadian newspapers as well as American and other international sources. Try to find some newscasts or coverage of events such as the Sputnik flight and the Apollo missions (especially Apollo 11 and 13.) Students should aim to identify the differences of opinion expressed by various national medias. They can try to locate archival American coverage of the Space Race with Russia. Ask them to view this archival research in the context of **leadership** and how governments at that time related power to winning the Space Race. Ask students to summarize their findings in a one- to two-page report.

2. **Writing outreach:** Ask students to imagine that they are reporters covering the Space Race. They can write an editorial from a Russian and an American point of view commenting on either the Sputnik flight or the Apollo 11 landing. Encourage them to consider their own points of view, while trying to balance fact and opinion. Or, as an additional exercise, students can write a completely biased editorial that exclusively favours either the Russians or the Americans winning the race. Ask them to note the differences between the two editorial pieces. A length of 250 to 300 words for each of these reports is sufficient.

3. **Interactive extensions:** Both of the above activities can be presented online on a blog or website, or be tweeted about to invite other students to comment. It would be interesting to involve students in Russia in this exploration so that they could share their reflections on the Space Race as it was reported in their media. (See the blogging and Twitter activities below.)





BLOG IT!

One of the most powerful changes to the world's culture brought about by the Internet is the democratization of news and media. This change has meant that anyone with an Internet connection can contribute to the world's pool of information. Students can do this by starting a blog or website or by joining chat groups on specific topics such as: their experience using **NFB Space School**, their knowledge of the ISS or personal accounts of taking on **leadership** roles. Starting a blog has never been easier than it is now. Most blog platforms are free and have a wide variety of tools that make uploading videos, sound files, Internet links and photographs fast and simple. Consider **Blogger**, **Weebly** or **WordPress** for example.

Age range 13 to 16

Time needed: 1 hour to introduce the topic. The overall time will depend upon how involved students become with their blogs (but 2 to 3 additional hours should be sufficient.).

Subject area links: Language Arts, English, French, Science, Social Studies.

Learning outcome(s): Students will learn the technical requirements for starting and maintaining a blog; students will become experts in the subject area of their blog.

Materials needed: Access to the Internet and access to traditional media, newspapers, television and online information sources.

Description and steps for this activity:

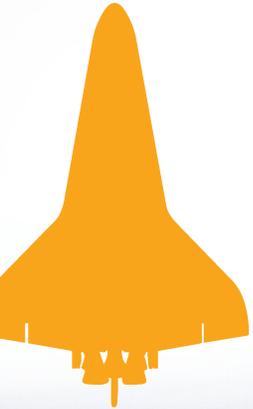
1. Teachers should stress that students need to choose a focus for their blogs so that they are as effective and interesting as possible. Perhaps they would like to focus on Chris Hadfield. If so, they could research his background and history and share it with their readers. Or, they may want to simply report on daily life at the space station by regularly checking in at the [ISS website](#). They may try to contact someone involved with the space station (even Hadfield himself, if they have the opportunity) to ask him or her some questions for their blogs. Alternately, they may want to blog about their personal stories about being a leader or encountering a leader. Encourage students to upload photographs and various media, but ensure that they belong to the students. Remind students that blogs are like public diaries. Ask them: What stories would you like to share with the world?
2. Students' reporting may be primarily visual or auditory if technology and time allow. They may choose to provide links to some other useful sites and videos that they have come across during their research. The choices are virtually endless; they are only limited by their imaginations.
3. If students are interested in visual media and have access to cameras (for instance, on their cell phones), they can make their own videos (such as simulated newscasts) or mini-documentaries and upload them to a sharing site such as [YouTube](#) or [Vimeo](#).



TEACHERS WITH LIMITED ACCESS TO THE INTERNET OR COMPUTERS

Many of the activities described in this guide can be presented visually. While blogs, animations, digital slideshows or videos are attractive options, “old school” posters, paintings, graphic novels and murals can also powerfully convey visual aspects of the study of **Leadership**, life aboard the ISS, etc. Some examples of activities in which the topic of **Leadership** could be explored visually include:

- an exploration of the qualities of a leader (as in Activity 1);
- a portrait of a mentor (as in Activities 3 and 4);
- a “campaign style” poster competition with the goal of presenting the best leader from among public figures, community members, colleagues or classmates.





MUSIC IN SPACE PROJECTS

Chris Hadfield's love of music has been well documented. For him, music brings people together and helps them to act as a team and to anticipate each other's actions. It has also been an invaluable way for Hadfield to reach out to people, gain their attention and establish his role as a leader. The following activities give students an opportunity to explore connections between music and **leadership**. They also allow students to understand how the topics of space and space exploration have inspired musicians and others in the artistic community.

Age range 11 to 16

Time needed: 1 hour to introduce the activity through discussion and sharing of videos and music; 1 to 2 additional hours could be devoted to developing playlists about space. Sharing with classmates could form part of this activity and may require an extra hour of class time. Should any students opt to make musical remixes as described in the interactive offshoot activity, this work could be done at home and presented to the class at a convenient time.

Subject area links: Language Arts, English, French, Social Studies, Music.

Learning outcome(s): Students will learn how space and space exploration have inspired musicians. They will understand how Hadfield has used music as an outreach and team-building tool.

Description and steps for this activity:

1. Educators can begin this activity by showing students some of Chris Hadfield's music videos:

Astronauts Chris Hadfield and Catherine Coleman perform "Ride On":

<https://www.youtube.com/watch?v=mA9dROqvC0k>

Chris Hadfield performs his rendition of David Bowie's "A Space Oddity":

https://www.youtube.com/watch?feature=player_embedded&v=KaOC9danxNo

"Is Someone Listening?": Chris Hadfield performs aboard the ISS while singer Ed Robertson (of the Barenaked Ladies) performs on Earth:

<http://music.cbc.ca/#/blogs/2013/2/Space-jam-watch-the-premiere-of-ISS-Is-Somebody-Singing>

2a. Research/online sharing activity: Students can create a blog about music from or about space and feature the songs they have selected in a playlist that they share online. Ideally, students from across the world would be able to comment and upload additional songs to create a worldwide repository of music about and from space. This may not be possible logistically, but educators can nonetheless discuss how the Internet facilitates this potential. See the resources below for playlists and earlier videos of musical collaborations between astronauts and musicians on Earth. Useful music-sharing sites include *SoundCloud* and *Grooveshark*.



MUSIC IN SPACE PROJECTS (*cont'd*)

2b. Students could share their playlists with professional astronauts, following the example set by the Space.com link in the resources section below. A blog or Twitter account could help to gather attention and provide a forum for students to include explanations of why they chose the songs on the list.

3. **Interactive extension:** The possibilities for interactive experiences related to music in space are extremely diverse, though limited practically by both class time and the availability of technology. Activities can be as simple as sharing and discussing music about space travel either in class or online, or as complex as remixing popular space-themed songs (using free online tools such as *Jam Studio*) or even composing music over the Internet with people from around the world using a program such as Garage Band. Online collaborations of this kind have become popular; consider for example the *Playing for Change* project that involved musicians from around the world recording songs together. Several of the tenets of that project could be applied to a similar space music collaboration project.

As these activities have the potential to begin conversations about music sharing, students will have the opportunity to replicate some of the experiences Chris Hadfield had while in space when he used his interest in music to reach out to people and communicate about the importance of space travel.

Additional resources to support music in space activities:

[A playlist of classic rock songs about space travel](#)

[A useful playlist of music for astronauts via Space.com](#)

The music/space connection—further examples: NASA hired musician and performance artist Laurie Anderson as an Artist in Residence to create music about space.

In addition to songs about space, there is a growing body of music that has been written utilizing sounds captured from space:

- Terry Riley and the Kronos Quartet recorded an album called *Sun Rings* that used the sounds of the planets recorded by the Voyager Mission on its journey to deep space.
- Dr. Fiorella Terenzi (an Italian musician) has created several works that use sounds derived from celestial radio signals.
- Mickey Hart, the former drummer for the Grateful Dead, has been using sounds from space in his *musical compositions* for many years.



MEDIA COVERAGE OF HADFIELD'S MISSION ABOARD THE ISS

While watching a film or interactive project with your students, it is important to not only examine the content, but also its construction. The following provides a brief background on media literacy:

*Media literacy is concerned with the process of understanding and using the mass media. It is also concerned with helping students develop an informed and critical understanding of the nature of the mass media, the techniques used by them, and the impact of these techniques. More specifically, it is education that aims to increase students' understanding and enjoyment of how the media work, how they produce meaning, how they are organized and how they construct reality...
Media literacy is a life skill.*

— ONTARIO ASSOCIATION FOR MEDIA LITERACY, ONTARIO MEDIA LITERACY / RESOURCE GUIDE

As per the Ontario Association for Media Literacy, media literacy education in Canada incorporates the following key concepts:

... 1 ...

All media are constructions. The media present carefully crafted constructions that reflect many decisions and are the result of many determining factors.

... 2 ...

The media construct versions of reality. Much of our view of reality is based on media messages that have been pre-constructed and have attitudes, interpretations and conclusions already built in.

... 3 ...

Audiences negotiate meaning in media. Each of us finds or “negotiates” meaning according to individual factors.

... 4 ...

Media messages have commercial implications. Much media production is a business, and so must be profitable. Questions of ownership and control are central.

... 5 ...

Media artifacts contain ideological and value messages.

All media products are advertising in some sense, proclaiming values and ways of life.

... 6 ...

Media messages contain social and political implications.
The media have great influence in politics and in forming social change.

... 7 ...

Form and content are closely related in media messages.
Each medium has its own grammar and codifies reality in its own particular way.

... 8 ...

Each medium has a unique aesthetic form.¹⁰

The Ontario Association for Media Literacy has published a *blog entry* specifically dedicated to Chris Hadfield—“the media-literate astronaut.”

An undertaking as big as Chris Hadfield's aboard the ISS attracts a considerable amount of media attention. As a moment in history, it offers an ideal opportunity for students to understand the roles that media plays in their daily lives and to examine the effects that various forms of media have on the formation of their opinions and perceptions. Before beginning any specific activity, teachers can discuss media in a general sense with their classes as a way of generating interest in the topic as well as getting an idea of their overall degree of “media savvy.” The questions can be modified depending on age, grade and ability levels.

¹⁰ See www.aml.ca



MEDIA LITERACY QUESTIONS RELATED TO SPACE EXPLORATION

... 1 ...

Where did you find your information about Hadfield's recent mission?

... 2 ...

What did you notice about the different types of information you received from various media outlets?

... 3 ...

Consider the archival material available on **NFB Space School**.
What sense do you get of how the astronauts of the past were portrayed in the media?

... 4 ...

Think about contemporary media portrayals of astronauts. How is the profession portrayed today?
Do you notice any significant differences from past eras?

... 5 ...

Are American and Canadian astronauts portrayed in the same manner as Russian astronauts in today's media? Which astronauts receive the most media coverage? Support your answers with examples.

... 6 ...

Did you follow Chris Hadfield's Twitter or Facebook feed while he was in space? Why or why not?
Why do you think he updated his social media profiles so often while he was aboard the ISS?

... 7 ...

Chris Hadfield did not only tweet with words; he also tweeted many photographs and videos.
Why do you think he did this?

... 8 ...

How would you describe the media's reporting of Hadfield's recent mission to space?
Consider some of the news reports you might have noticed.
(Educators might want to provide students with some examples for this question.)

... 9 ...

Are you surprised by the amount of media attention Hadfield's mission received? Why or why not?

... 10 ...

Hadfield was not alone aboard the ISS. Who were the other two astronauts who were part of his mission? Did you hear about them in the news as often as you heard about Hadfield?
Why or why not?

... 11 ...

How would you relate the medium of Twitter to other communication tools from the past
(from 50 years ago, 100 years ago, 200 years ago, etc.)?
How is Twitter similar or different from these tools?



SEARCHING FOR BIASES

Age range 11 to 16

Teachers should select appropriate media for the age group of the class.

Time needed: Depending on the interest of students, this could be a short activity that involves analyzing media at the beginning of the class before moving to another activity; however, if the students are interested in the topic, the discussion and follow-up could take place over 2 to 3 classes.

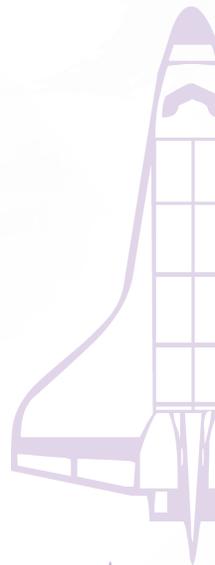
Subject area links: Social Studies, Civics, English Language Arts, French Language Arts, Science.

Learning outcome(s): Students will be able to approach and deconstruct media critically.

Materials needed: Media of various forms: newspapers, magazine articles, television news or documentaries, blog posts or online news reports in all formats.

Description and steps for this activity:

1. Teachers should search for dramatic, overblown, unreliable sources of information—such as tabloids (*National Enquirer*, etc.), TV commercials or highly partisan websites—and share a selection of these with the class. Teachers could clarify the difference between advertisements and objective research to make the distinction between objective news and partisan news more clear. To elucidate the distinction, educators might ask a question such as the following: “Imagine that you want to determine whether a certain product is healthy or safe to use: would you trust claims from the manufacturer of that product or from scientific research conducted by a university?”
2. Ask students for their reactions.
3. Based on these reactions, generate a discussion regarding whether students trust all sources of information equally. Ask students “why or why not,” and how they decide whether a media source is reliable.
4. Additional discussion questions:
 - Can all sources of information be deemed equally trustworthy?
 - Who/which source(s) do you trust the most? Why?
 - Which sources of information do you trust somewhat/mostly?
 - Which sources of information are you most sceptical of? Why?
 - Ask students to give examples of claims they have read or seen that they don’t think are reliable. (If students have trouble with this, ask them whether they always trust TV commercials, and whether they believe everything they read on the Internet.)
 - Discuss how all media is designed for a certain audience. For example, most cartoons are created for kids and present unreal or fantastic situations. Are the creators of this media trying to fool kids? Or rather, do viewers understand that cartoons are for kids, and are not intended to communicate information in the same way that the news, your teachers, or textbooks do?





UNDERSTANDING HOW TO DECONSTRUCT MEDIA MESSAGES AND PLATFORMS

Age range 11 to 16

Discussion questions and expectations should be adjusted for specific learners.

Time needed: 1 to 2 classes of 45 minutes to an hour.

Subject area links: English and French Language Arts, Social Studies.

Learning outcome(s): With direct relation to Hadfield's mission, students will analyze media samples and develop a greater understanding of the subjective nature of media.

Materials needed: Access to media: online reports, television news and newspaper articles.

Description and steps for this activity:

1. The teacher should select a media sample about the current ISS mission (or previous historical space missions) from videos, newspaper articles or advertisements and examine it carefully with students.
2. Students should next locate and compare video, blog and traditional newspaper reports of the same story.
- 3a. Ask the class questions including: Can you discern the writer or presenter's opinion of the subject? Is there an obvious bias expressed, or does the story simply present information for the reader or audience to interpret themselves?
- 3b. If step 3a proves difficult, ask further questions such as: Who is the intended audience? What type of language is being used? Who is presenting the news? Are they presenting biased or neutral arguments? Please define your answers with examples. What form of media is the information presented in? Does format change the way the news item is reported?
4. As an outreach or homework project, ask students to choose three additional media samples: one that they trust, one they mostly trust and one that they seriously question. Students will write a journal entry to describe why they feel this way about the way the material is presented. If students are having difficulty with this activity, some of the Five Key Questions about Media Literacy may be helpful:

... 1 ...

Who created this message?

... 2 ...

What creative techniques are used to attract my attention?

... 3 ...

How might different people understand this message differently than me?

... 4 ...

What values, lifestyles and points of view are represented in, or omitted from, this message?

... 5 ...

Why is this message being sent?¹¹

¹¹ http://www.medialit.org/sites/default/files/14B_CCKQPoster+5essays.pdf

ACTIVITY 3

Media Literacy

ACTIVITIES



TWEETING FACTS

Chris Hadfield is the first astronaut to extensively use Twitter as a means of communicating information about space travel and generating excitement about his mission. A selection of his tweets can be found on the Space School website at <http://spaceschool.nfb.ca/tweet/all/1/>. This activity (and the following one) will enable educators to extend study of these tweets into active Twitter projects for their students.

Age range 13 to 16

Time needed: Students will require at least one class period of 45 minutes to create their Twitter messages. Follow-up and analysis of replies can be undertaken during the next lesson. If student enthusiasm and online replies warrant, follow-up of this project can be ongoing at the teacher's discretion.

Subject area links: Social Studies, Language Arts, Creative Writing, Science.

Learning outcome(s): After this introductory Twitter activity, students will be able to communicate ideas effectively within the limits of the format's 140 characters. Further emphasis will be placed on the articulation of comprehensive and focused ideas as students communicate with their classmates through a live, online platform.

Materials needed: Access to the Internet and a Twitter account.

Description and steps for this activity:

1. This activity encourages students to communicate bite-sized reports based upon their research relating to Hadfield's mission aboard the ISS. Students should use the **NFB Space School** site and links offered from the site (**Learn More**) to find succinct, pertinent information about Hadfield's ISS mission. These facts should then be edited into tweet-sized bulletins and published online. Teachers may choose to encourage every student (provided they have obtained parental permission) to acquire a Twitter account. However, students need not open their own Twitter account if educators are uncomfortable with this initiative, and can elect to tweet from a shared classroom account moderated by the educator.
2. As a class, decide upon a discussion hashtag (examples include: #MrTGr7ISS; #MsVHadfieldResearch) and ensure that the students all publish their tweets using the same hashtag. As a class, you can review and assess the online conversation using this hashtag. Encourage students to tweet their findings and respond to their classmates about their findings.
3. Tweets can be printed to hand in or assessed online.

ACTIVITY 4

Media Literacy

ACTIVITIES



CREATIVE TWEETS ABOUT LIFE IN SPACE

Age range 13 to 16

Time needed: Students will need at least one class period of 45 minutes to create their Twitter messages. Follow-up and analysis of replies can be taken up the next lesson. If student enthusiasm and online replies warrant, follow-up of this project can be ongoing at the teacher's discretion.

Subject area links: Science, Social Studies, Language Arts, Creative Writing.

Learning outcome(s): Students will be able to identify the significance of certain facets of life in space. These could include descriptions of living in zero gravity, eating in space, life on the ISS, or what can be seen and identified looking out the window of the spacecraft.

Materials needed: Access to the Internet and a Twitter account.

Description and steps for this activity:

1. Students should begin with some pre-reading and/or pre-screening about life aboard the ISS. Teachers can direct students to [Chris Hadfield's YouTube page](#), for instance. They can also research previous accounts of space travel from other missions.
2. After the research phase, have students begin to formulate tweets about aspects of life aboard the ISS that they find interesting. These tweets can be more creative, emotional and reflective than those required for the previous media literacy assignment in this section. Teachers may choose to encourage every student (provided they have obtained parental permission) to acquire a Twitter account. However, students need not open their own Twitter account if educators are uncomfortable with this initiative, and can elect to tweet from a shared classroom account moderated by the educator.
3. As a class, decide upon a discussion hashtag (examples include: #MrTGr7ISS; #MsVHadfieldResearch) and ensure that the students all publish their tweets using the same hashtag. Encourage students to tweet their findings and respond to their classmates about their findings.
4. Tweets can be printed to hand in or assessed online.





LINKING CHRIS HADFIELD'S MISSION TO AN EXPLORATION OF SOCIAL MEDIA

Age range 11 to 16

Time needed: This topic can be explored as a whole class or in a small group setting. One class period of 45 minutes is long enough to conduct the initial discussion in either case. Educators should assign students the homework of searching online for articles about the ISS. Their findings can be shared during the next class period. Any extension of the assignment beyond the basic scope will require additional class time.

Learning outcome(s): Students will be able to recognize bias in the news and observe how different media outlets report the same story.

Materials needed: Access to the Internet and writing materials.

Description and steps for this activity:

1. Begin the discussion by screening this YouTube video of *Chris Hadfield discussing social media*.
2. Ask students to comment on the video and on their own social media usage. How often do they access social media? Do they access it for entertainment, to find information or for social reasons?
3. Discuss how each traditional media outlet has its own focus and expected audience; some sites cover certain stories in depth, while the same story will not even be mentioned on other sites, or addressed only briefly. Ask students why they think this is the case.
4. After students have a basic handle on this topic, they can do an additional online search for articles or videos that have differing points of view about the ISS, differentiating between those that are very positive, those that are neutral and present facts without any subjective comment and others that may be somewhat negative. Ask students to provide a few reasons for their classification of each article.
5. Ask students to consider whether the articles or videos they analyzed changed how they think about the Space Station or Hadfield's mission.
6. Ask students what kind of information can be found about Chris Hadfield on the Internet? Is it simply factual or is some of the information subjective i.e., would they define any of the information as particularly positive or negative in its portrayal?

Interactive Outreach:

If these activities pertaining to media literacy and social media are popular with students, the class could start a blog to feature their observations on some of the material. They can discuss (and invite others to comment upon) the articles, images or videos uncovered in their research assignments. **Blogger**, **WordPress** and **Weebly** are good sites that offer free and easy-to-use blog templates.



USEFUL WEBSITES

The Space Book Library: a useful list of suggested reading about space travel, real and imagined.

NASA: the largest online repository of facts, images and historical information about space exploration. Many useful sections of this site are highlighted in the **Learn More** section of the **Teach It** page.

Canadian Space Agency: an excellent website providing insight into space travel from a Canadian perspective.

Current Position of the ISS: a map (updated every second) displays the current position of the International Space Station.

Chris Hadfield's YouTube Channel: Hadfield clearly understands the power of social media and online communication. His YouTube channel features a range of videos covering topics from music to the practicalities of life aboard the ISS.

A Footnote to Help Contextualize the Space Race

When Chris Hadfield first dreamed of becoming an astronaut in 1969, after Neil Armstrong landed on the moon, a collaborative space exploration project like the International Space Station (ISS) would have been impossible.¹² At that time, the Space Race was a contentious political issue between the two superpowers of the day, the United States of America and the Union of Soviet Socialist Republics (USSR) competing to be first to land a person on the moon.¹³ With the passage of time, the USSR disbanded and Russia adopted more of an open-market capitalist system that allowed for more collaboration between the USA, Russia and other nations to create unified space programs such as the International Space Station.¹⁴

¹² Did Politics Fuel the Space Race? When Science, Politics and Money Collided, <http://usgovinfo.about.com/library/weekly/aa083001a.htm>

¹³ <http://www.history.com/topics/space-race>

¹⁴ Toward a Theory of Space Power, Randall R. Correll, Chapter 26 'Emerging Actors' - <http://www.ndu.edu/press/space-Ch26.html>





RELATED NFB FILMS

Available on CAMPUS:

- *Cosmic Zoom*
- *Discover Science Series* (26-episode series)
- *Hubert Reeves: Star Teller*
- *Satellites of the Sun*
- *Science Please – Part 1*
- *Science Please – Part 2*
- *Shadow Chasers*
- *Toutatis*
- *Universe*

Related NFB Films Available for Purchase on DVD:

- *1974*
- *Comet*
- *Cosmic Collision*
- *Discover Science Series*
- *My Jules Verne*
- *Pioneer Swaps with Astronomy Enthusiast*
- *Starlife*

Other Films About Space

Space travel has interested filmmakers since the early days of cinema, and it can be both revealing and entertaining to screen films about space that were made before the current scientific understanding of what was “out there.” Both of the following links include many suggestions for classroom viewing about space exploration.

[Wikipedia List of Films About Space](#)

[IMDB List of Films About Space](#)

CREDITS

The **NFB Space School: Leadership** educator’s guide was written by Doug Heselgrave of **Writeous Word Company**, an experienced classroom teacher, curriculum designer, educational consultant and textbook writer. It was written in collaboration with Claudia Sicondolfo, Team Leader of Educational Programming, NFB Education Team.

