References

Program Overview
Launch your learning into space—join us for Global Rocket Launch Day! This is a great chance to learn more about rockets and working for NASA—all while launching rockets to celebrate the 50th anniversary of Apollo.

Targeted Grade Levels
Grades 4–12

Facilitation Notes
The time for each activity can vary depending on the number of participants you have and how enthusiastic they are about each activity. It may be helpful to plan ahead for flexibility. None of the activities are reliant on one another, so you might choose to skip or repeat activities based on the group you’re with.

Welcome and Introduction Activities
9:00–9:45

• Soft balls to toss

Welcome
Welcome everyone to the event. Explain who you are, your relationship to the 4-H program, and briefly explain the purpose of your time together—that today we will be launching rockets with people from around the world while learning more about space and NASA.

Name Ball Toss Game
Gather a group into a circle. Go around the circle and have each youth introduce himself/herself. Then give the ball to one youth. As the youth toss the ball to one another, have them say the name of the person they are tossing it to. Speed up and slow down the tossing for fun. Then, for a challenge, introduce more than one ball to the group!

Additional “Get to Know You” Games
See the link below for extra ideas:

https://www.icebreakers.ws/get-to-know-you

NASA 101: Learn about Apollo 11
9:45–10:45

• Computer with internet connection
• Printed-off copy of text
Introduce NASA. NASA stands for National Aeronautics and Space Administration.

- Ask youth what they know about NASA. Hold a brief discussion.
- Play video or read text to show students to share information.

Video
Ask youth to look for what skills might be needed to get a job at NASA. Play video, then discuss.

https://www.youtube.com/watch?v=WeA7edXsU40

Text
Ask youth to listen for key details such as what NASA does and where NASA is located. Discuss after reading and find NASA locations on a map.

https://www.youtube.com/watch?v=WeA7edXsU40

Introduce Apollo 11

- Computer with internet connection and projector
- Optional Books:
  - Moonshot by Brian Floca
  - List of Books from Popular Mechanics about Apollo 11
- Phone or other recording device.

Mission Overview
These sites overview the Apollo 11 mission. If you have access to a computer and projector (or multiple computers), explore the sites together. Click on items that are of interest to the youth to learn more. Videos can also be downloaded for later viewing.


Take Apollo 11 Quiz
This quiz could be done offline, also, as needed. Youth could write down their answers to questions, while the leader shares the answers.


Reenact Apollo 11 Scenes and Record
View a couple of videos from the site listed below. Then reenact, for fun, and record. The use of costumes and props are optional.

https://www.nasa.gov/multimedia/hd/apollo11_hdpage.html
Bathroom/Snack Break
10:45–11:00

Rocket Launch #1: Straw Rockets
11:00–12:00

- See PDF for a full list of materials
- Purchase rocket launcher, straws, and modeling clay for tip

Activity

- Follow the detailed instructions for straw rockets from NASA:

The straw rockets from NASA allow for a lot of variation. Included in the directions is a review of the science concepts tied to the straw rockets. Feel free to use all or part of the lesson provided by NASA.

- Or consider purchasing a straw rocket launcher such as:
  http://www.pitsco.com/Mini-Straw-Rocket-Launcher

Do: After building the straw rockets, take time to create challenges with the youth. Challenges might include: highest launch, farthest launch, ability to hit a target, and more. Then launch your rockets!

Reflect/Apply: Discuss the rocket launch as a group. What worked well? What didn’t? What changes did you make to help your rocket meet the challenges?

Rocket Reference: https://www.youtube.com/watch?v=Kr78OOr2sCc
Rocket Launch Video: https://www.youtube.com/watch?v=sB_nEtZxPog

More about SpaceX Falcon Heavy:

Lunch
12:00–12:30

Rocket Launch #2: Stomp Rockets
12:30–2:00

- See link for a full list of materials
Stomp Rockets from NASA

*The rocket launcher will need to be assembled ahead of time.

Follow the directions for building a stomp rocket here: [https://www.jpl.nasa.gov/edu/teach/activity/stomp-rockets/](https://www.jpl.nasa.gov/edu/teach/activity/stomp-rockets/)

After building the rocket launcher and gathering needed materials, begin the process of using the Engineering Design Process to learn more about rockets and have a successful launch!

**Do:** After building stomp rockets, take time to create challenges with the youth. Challenges might include: highest launch, farthest launch, ability to hit a target, and more. Then launch your rockets!

**Reflect/Apply:** Discuss the rocket launch as a group. What worked well? What didn’t? What changes did you make to help your rocket meet the challenges?


**Space Game/Review of Concepts Learned**

2:00–3:00

Dress Rehearsal and Performance

- Paper
- Pencils
- (Optional) Computer with internet connection and projector

**Game/Review**

Have the youth write questions for a space trivia game. The game could be done on paper or use an online platform such as Kahoot. Break the groups into teams and have a fun trivia challenge! Or play a game of Pictionary using key words from the day.

Hold a discussion about what was learned. Ask youth to reflect on what they have learned and share how it might be applied in their lives.

Next, plan for the end-of-the-day showcase. Work with youth to create a presentation that includes all participants in some manner.

**Performance**

3:00

Invite youth to share about what they have learned today with parents and guardians. Be sure to share photos on social media and tag the Global Rocket Challenge.
Program Cover Sheet

The information collected in this document will be used to keep collected survey data organized for data entry. The cover sheet should be completed by the 4-H staff associated with the program. For each new program, complete a new cover sheet. The information will be entered into Qualtrics at the State 4-H office.

What is the name of this program?

In what County did this program take place?

What delivery mode was used when implementing this program?

- Day Camp (Has a main focus on outdoor recreation and/or the environment, and youth return home for the evening. If it does not have an outdoor focus, it is NOT a camp)
- Overnight Camp (Main focus is outdoor recreation and/or the environment. Includes one or more nights in provided housing to foster group interdependence)
- Club
- Afterschool (Has a primary goal of providing supervision and a safe, engaging learning environment for youth when they are NOT in school. This can take place before school, after school, weekends, during breaks, late start, early out, etc.)
- School Enrichment (Takes place in school or school field trip during school hours)
- Special Interest/Short Term (Takes place outside of school hours, does not have a primary goal of outdoor/environment, does not provide out-of-school care/supervision)

Who administered this survey? Please provide a name and email. (This will be helpful if any questions arise about this segment of data)

Iowa 4-H Common Measures

Dear Participant:

You have been given this survey because you have participated in a 4-H program or project and 4-H would like to learn about you and your experiences in 4-H.

Your answers are important and they will be kept private. But, if you don’t want to fill out the survey, you don’t have to or if there is a question you don’t want to answer, you can leave it blank.

There are no right or wrong answers, so please answer all questions honestly.

Thank you for your help!
Your Interest in Science and Science Thinking

Are you interested in learning about animal science?

☐ Yes
☐ Usually
☐ Not Really
☐ No

Are you interested in learning about plant science?

☐ Yes
☐ Usually
☐ Not Really
☐ No

Are you interested in learning about environmental science?

☐ Yes
☐ Usually
☐ Not Really
☐ No

Are you interested in learning about robotics?

☐ Yes
☐ Usually
☐ Not Really
☐ No

Are you interested in learning about engineering?

☐ Yes
☐ Usually
☐ Not Really
☐ No
How much do you like science?
- A lot
- A little
- Not at all
Would you like a job that uses science? ***
- Yes
- Sort of
- No
How much do you like engineering? ***
- A lot
- A little
- Not at all
Would you like a job that uses engineering? ***
- Yes
- Sort of
- No
Do you ask questions about how things work?
- Yes
- Usually
- Not Really
- No
Do you try new things to see how they will work?
- Yes
- Usually
- Not Really
- No
Do you look at how things are the same or different?
- Yes
- Usually
- Not Really
- No

Do you compare how different things work?
- Yes
- Usually
- Not Really
- No

Do you take things apart to see how they work?
- Yes
- Usually
- Not Really
- No

Do you come up with ideas for how to build new things?
- Yes
- Usually
- Not Really
- No

At 4-H, did you learn new things about science? ***
- Yes
- Sort of
- No
At 4-H, did you learn new things about engineering? ***
- Yes
- Sort of
- No

At 4-H, did you talk about how science can be used to help solve everyday problems?
- Yes
- Sort of
- No

Have you shared your science-related project with others?
- Yes
- Sort of
- No

**Your Science Skills and Attitudes**

Do you know how to ask a hypothesis that can be tested?
- Yes
- Sort of
- No

Do you know how to plan an experiment?
- Yes
- Sort of
- No

Do you know how to analyze data to draw conclusions about a hypothesis?
- Yes
- Sort of
- No
Do you know how to communicate the results of an experiment to others?
- Yes
- Sort of
- No

For the following questions, please mark how much you agree with each sentence.

I like science.
- Strongly agree
- Agree
- Disagree
- Strongly disagree

I would like a job that involves using science.
- Strongly agree
- Agree
- Disagree
- Strongly disagree

I would like to study science after high school.
- Strongly agree
- Agree
- Disagree
- Strongly disagree

**Your Engineering Skills and Attitudes**

Do you know how to define an engineering design problem?
- Yes
- Sort of
- No
Do you know how to identify potential solutions to a design problem?
- Yes
- Sort of
- No

Do you know how to evaluate test results to identify the best solution?
- Yes
- Sort of
- No

Do you know how to communicate a design solution to others?
- Yes
- Sort of
- No

For the following questions, please mark how much you agree with each sentence.

I like engineering.
- Strongly agree
- Agree
- Disagree
- Strongly disagree

I would like a job that involves using engineering.
- Strongly agree
- Agree
- Disagree
- Strongly disagree
I would like to study engineering after high school.

- Strongly agree
- Agree
- Disagree
- Strongly disagree

**About You**

How old are you?

________ years old

What grade are you in? If it is summer break, which grade will you be starting in the fall?

________ grade

Which of the following best describes your gender?

- Male (boy)
- Female (girl)

Which of the following best describes your race?

- Asian
- Black or African American
- Hispanic or Latino
- Native American
- Native Hawaiian/Other Pacific Islander
- White or Caucasian
- More than one race
- I don’t know
How many hours do you typically spend on 4-H activities each week?

- Less than 1 hour
- 1 hour
- 2 hours
- 3 hours
- 4 hours
- 5 or more hours

Are you involved in 4-H at the county level?

- Yes
- No

Are you involved in 4-H at the state level?

- Yes
- No

Are you involved in 4-H at the national level?

- Yes
- No

Which of the following best describe how you are involved in 4-H? For each, circle one answer.

Clubs
- Yes
- No

Camps
- Yes
- No

Afterschool programs
- Yes
- No

In-school programs
- Yes
- No

Local fairs/events
- Yes
- No

Community service projects
- Yes
- No

Working on projects at home
- Yes
- No

Other
- Yes
- No

Thank you very much!

Please return this form as directed.