

**Lesson Topic:** Effects of Space Exploration

**Objective:**

Students will be able to:

1. Identify and describe how space exploration affects the state of Florida.
2. Describe the nature of the Kennedy Space Center.
3. Identify the components of a space shuttle
4. Apply the importance of space exploration to the Florida culture through design.

**Time Required:** 75 minutes

**Materials Needed:**

- Teacher computer with internet access
- Projector/Smartboard
- 1 computer/laptop/iPad per student with internet access
- Effects of Space Exploration handout (attached)
- Space Exploration Video: [Escape Velocity - A Quick History of Space Exploration](#)
- Space Shuttle Website: [Human Space Flight \(HSF\) - Space Shuttle](#)
- Kennedy Space Center Website: [Visit Kennedy Space Center Visitor Complex at Cape Canaveral](#)
- Coloring pencils/Markers

**Teacher Preparation:**

- Assign a Legends of Learning Content Review [Quick Play](#) playlist for the day(s) you will be teaching the lesson.
  - Content Review - Middle School - Effects of Space Exploration
- Make copies of Effects of Space Exploration Worksheet (1 per student)

**Engage (10 minutes):**

1. Pass out the Effects of Space Exploration Handout.
2. Ask students “What do you know about space exploration?”
  - a. Draw the words “Space Exploration” on the board with a circle around it.
    - i. As students share their answers write their answers on the board and link them to the Space Exploration circle with a line.
3. Tell students “We are going to watch a short video about the history of space exploration and how it has evolved over time. In the space provided on the handout, jot down any notes that you find interesting or important.
4. Play the [Video](#).
5. Allow a few students to share what they wrote down in their notes.
6. Tell students “Today we are going to spend some time learning about how Space Exploration affects the State of Florida through their culture and economy.”

**Explore (20 minutes):**

1. Tell students “Using your handout as a guide, go to the following website.
  - a. Look through the website and see what you can learn to help you answer the questions and give you a better understanding of the Kennedy Space Center

and how the state of Florida is impacted by it.”

2. Tell students “Then, check out the next website to give you a little more information on the space shuttle.
  - a. Take notes in the space provided on your handout.”
3. Give students some time to share their findings together in pairs.

**Explain (20 minutes):**

1. Allow students some time to share and discuss what they learned through their research about the Kennedy Space Center and of space shuttles.
  - a. Possible topics students may bring up: upcoming launches, astronaut training, Apollo moon landings, etc.
  - b. Space Shuttle - launches like a rocket, maneuvers like a spacecraft, and lands like an airplane. It is a reusable spacecraft.
    - i. Components of the space shuttle: orbiter, external fuel tank and rocket boosters.
2. Ask students “With all of this amazing space exploration that has gone on in our nation’s history and the exploration that is still going on at places like the Kennedy Space Center, how does this impact the state of Florida? Let’s read the following article in your handout.”
3. Read the article from the handout aloud to students or choose a couple of volunteers to do so.
4. Tell students “As we discuss, we will write in the last two boxes on the handout.”
5. Ask students “ With the person sitting next to you, discuss the following questions:
  - a. How does space exploration affect Florida’s economy?” (provides jobs, taxpayers help fund space exploration, the Kennedy Space Center creates tourism, as well as the launches themselves).
  - b. How is space exploration a part of the Florida culture?” (With Cape Canaveral and the Kennedy Space Center in their state there is a rich history of space exploration within their culture, education is fostered through the KSC as well as viewing a real launch. NASA has created a lot of new technology that has been used in space missions but some can even be used in mainstream public).
    - i. Write answers on the board so students can fill it in their chart on the handout.

**Elaborate (15 minutes):**

1. Tell students “On the last page of your handout you will find a picture of a space shuttle. I want you to design a paint job for this space shuttle. This design should have ties to Florida and the rich history of space exploration that Florida has.”
2. Tell students “Use all the research and information that you learned today to create a thoughtful design. Use colored pencils or markers to complete the design.”
3. Give students time to design and color.

**Evaluate (10 minutes):**

1. Have your students [sign in to Legends of Learning](#). Instruct students to complete the Content Review playlist.
2. [Analyze student results](#) to determine what concepts need to be a focus for reteaching.



**Additional Lesson Strategies:**

- To use Legends for additional instruction, create a [custom playlist](#) with an [instructional game](#) and pre and post [assessment](#).
- To use Legends for a quick formative assessment, create a 5-question [assessment](#) in a [playlist](#).
- To use Legends for a student-directed experience, create a [targeted freeplay](#) playlist.
- Encourage students to play on their own at home in [Legends of Learning: Awakening](#) for a student-driven experience including avatars, battling, and quests all centered around topics they are covering in class.



Name: \_\_\_\_\_

# Effects of Space Exploration

## Part 1: Space Exploration Video Notes

Write down notes from the video at the beginning of today's lesson.

## Part 2: Website Exploration

Kennedy Space Center

Go to the following website: <https://www.kennedyspacecenter.com/>

1. What is the Kennedy Space Center (KSC)?
2. When is an upcoming launch?
3. What can you do there?
4. Where is KSC located?
5. What are 3 other facts or pieces of information you find interesting?



### Space Shuttle Basics

Go to the following website: <https://spaceflight.nasa.gov/shuttle/reference/basics/index.html>

1. What is a space shuttle?
2. Name 3 of our history's space shuttles.
3. What are the three components of a space shuttle?

Article

# Space business an economic engine for Florida | Opinion

<https://tinyurl.com/s954wsk>

By PEDRO MEDELIUS

MAR 09, 2017 | 12:00 PM

Recovering from the downturn following the retirement of the Space Shuttle program six years ago, Florida continues to successfully expand the business of space.

Building upon our heritage, the space industry and Florida are evolving to meet new competitive challenges including resuming manned flights in the near future. These initiatives include establishing commercial operations in suborbital and low-Earth orbits, as well as developing national deep space human exploration capabilities involving Orion and NASA's Space Launch System (SLS).

All Floridians should be proud to know space operations and facility upgrades continue to progress at Kennedy Space Center and Cape Canaveral Air Force Station. The Vehicle Assembly Building, a crawler transporter and a firing room are being modified to support the SLS launches. Furthermore, the Executive Office of Gov. Rick Scott announced that the budget for the 2017-18 fiscal year, starting July 1, 2017, includes \$34 million for launch complex improvements.

Growth in the space business arena impacts all of Florida, not just the Space Coast. Today more than 150,000 Floridians are employed by more than 19,000 aerospace companies generating in excess of \$20 billion in annual sales and revenues. All 67 counties contribute to this multi-billion dollar industry. The aerospace product and parts manufacturing sector is the largest manufacturing segment in Florida with an average wage of \$77,343.

Florida's future continues to look bright. Private companies are launching cargo to the International Space Station and preparing to fly American astronauts from American soil in the next few years, eliminating America's dependence on foreign nations for space access and demonstrating — once again — we are the preeminent space faring nation in the world, with Florida



being the premier launching location in the U.S. We also are developing new spacecraft and rockets, along with the necessary infrastructure to support launch operations — more capable and powerful than those used to put humans on the moon — pushing the frontiers of human spaceflight exploration forward to Mars and beyond.

On Wednesday, Florida Space Day, industry leaders and other aerospace supporters met with Florida legislators and executive branch officials in Tallahassee to discuss the state's space industry and effective strategies for leveraging economic development policies to attract more private sector investment and jobs, and effectively face on-going active competition from other states.

Florida's elected officials have played an extraordinary role of winning jobs and capital investment from aerospace throughout the state of Florida, and commercial companies have started investing on manufacturing facilities at Kennedy Space Center's Exploration Park managed by Space Florida.

Florida's aerospace industry supports both the legislative initiatives and priorities of Enterprise Florida and Space Florida. These major organizations have driven the state's success in competing for aerospace sector jobs.

Specifically, we support the following legislative actions:

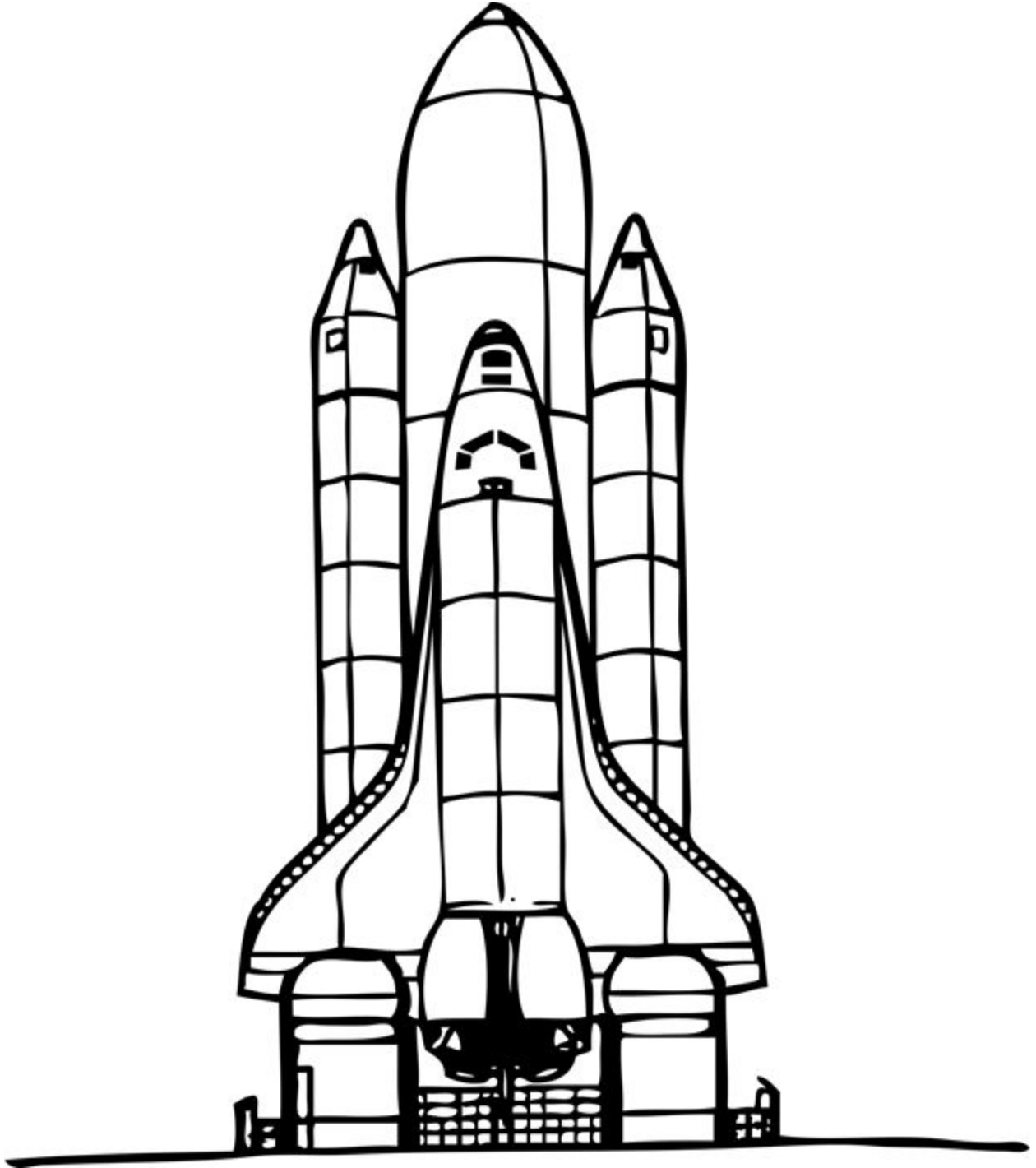
- Florida's economic development efforts
- Maintaining Space Florida's budget of \$19.5 million

Florida is poised to exceed the competitive challenges of this new space era with a high-tech ready workforce, innovative use of existing space infrastructure, a robust educational system, pro-job creation business environment and unmatched quality of life. With the help of Florida leadership and the Legislature, we will create additional high-tech/high-pay jobs, scientific discoveries, business opportunities, and support educational excellence in Science, Technology, Engineering and Math (STEM) for our next generation of Floridians.

*Pedro Medelius is the chief technologist for ASRC Federal Space and Defense, and the chair of Florida Space Day 2017.*

<b>How Does Space Exploration Affect Florida's.....</b>	
<b>Economy?</b>	<b>Culture?</b>







Name: KEY

## Effects of Space Exploration

Kennedy Space Center

Go to the following website: <https://www.kennedyspacecenter.com/>

6. What is the Kennedy Space Center (KSC)? **Primary launch center for human space flight. It is a working field center for space flight, but also includes a visitor center for the public.**
7. When is an upcoming launch? **Answers will vary based on when this lesson is used.**
8. What can you do there? **You can see an actual space shuttle launch! There are also exhibits to teach about space, spacecraft, and the history of space exploration.**
9. Where is KSC located? **Merritt Island Florida**
10. What are 3 other facts or pieces of information you find interesting? **Answers will vary.**

Space Shuttle Basics

Go to the following website: <https://spaceflight.nasa.gov/shuttle/reference/basics/index.html>

4. What is a space shuttle? **The space shuttle is the world's first reusable spacecraft, and the first spacecraft in history that can carry large satellites both to and from orbit. The shuttle launches like a rocket, maneuvers in Earth orbit like a spacecraft and lands like an airplane.**
5. Name 3 of our history's space shuttles. **Any three of the following are acceptable: Columbia, Challenger, Atlantis, Endeavor, Discovery, Enterprise.**
6. What are the three components of a space shuttle? **Orbiter, external fuel tank and rocket boosters.**

<b>How Does Space Exploration Affect Florida's.....</b>	
<b>Economy?</b>	<b>Culture?</b>
<ul style="list-style-type: none"> <li>• Provides jobs</li> <li>• Taxpayers help fund space exploration</li> <li>• The Kennedy Space Center creates tourism, as well as the launches themselves</li> </ul>	<ul style="list-style-type: none"> <li>• With Cape Canaveral and the Kennedy Space Center in their state there is a rich history of space exploration within their culture</li> <li>• Education is fostered through the KSC as well as viewing a real launch.</li> <li>• NASA has created a lot of new technology that has been used in space missions but some are now used in mainstream public</li> </ul>