



Space adventures



Follow along as Captain Jake and his astronaut crew embark on an exciting expedition through space. Solving these problems is sure to save the day. We have lots to learn, so let's be on our way!

Grades 5–6

WEEK 1

Captain Jake and his crew are making preparations for their space voyage. Their ship, the *USS Braxton*, has 7 fuel tanks that hold 50 gallons each. The crew has been allotted 1000 quarts of fuel for the mission. Four of the tanks must be $\frac{4}{5}$ full at the start of the mission. If the last 3 tanks must have an equal amount of fuel, how much fuel can the crew put in each tank? Describe to a partner your strategy for solving this problem.

WEEK 2

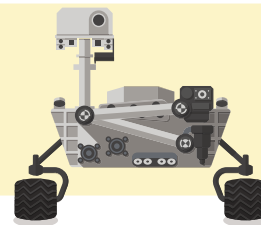
The ground team created a model of the crew's flight path and laid it out on a coordinate plane with Earth located at $(0, 0)$. The ship will travel in a straight line away from Earth until it reaches the Calan solar system, located at $(2, 5)$. From there, they will change course and will travel in a straight line to the Relician system, located at $(5, 2)$. After their stopover there, they will travel directly back to Earth. Predict the shape the ship's path will create. Use grid paper to draw the path, then compare your results to your prediction. Describe your thinking.

WEEK 3

The food storage crates on the *USS Braxton* are rectangular prisms that have a volume of 1 cubic meter. The food parcels are $8\text{ cm} \times 6\text{ cm} \times 3\text{ cm}$. How many food parcels can fit in each storage crate? The crew has 10 crates. If there are 7 crew members (including Captain Jake) and each crew member must consume the contents of 4 food parcels each day, how long can the mission last before they run out of food? Explain 2 possible strategies for solving this problem.

WEEK 4

The *USS Braxton* can travel an average of 1000 miles for every 20 gallons of fuel. If the ship's fuel allotment is 250 gallons, how far can the ship go during the course of this mission? If the ship lands on any planets on the journey, the landing and takeoff would use up 300 gallons. If the crew chooses to land on 2 planets, how far can the ship travel?



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WEEK 1

Ground control clears the ship and the crew for launch. A series of 6 tasks must be accomplished, in order, before liftoff. If each task takes 7–12 minutes and the crew begins at 7:01 a.m., what is the earliest that the *USS Braxton* can take off? What is the latest that it will be ready? Draw a picture to show your thinking. Find a classmate who used a different strategy and explain your pictures to each other. Assuming that Captain Jake's crew finishes as quickly as possible and it takes 32 minutes to break through the atmosphere, what time will it be when the crew reaches space?

WEEK 2

Captain Jake wants to host a party for the crew one evening on the ship while at a stopover on the space station. Before the journey begins, he will buy all the food and decorations for the party. Use the table to the right to make a plan for what he should buy. He has \$85 to spend, and he wants enough food for 7 people. Compare your plan with a partner's plan; how are they similar and different?

Item	Cost	Item	Cost
Water	\$1/bottle	Bag of chips	\$3/bag
Iced tea	\$3/gallon	Tablecloth	\$5 each
Footlong sub sandwich (cut in quarters)	\$6/sub	Balloons	\$1 each
Pizza (8 slices)	\$12/pizza	Streamers	\$6/pack
Fresh fruit cup	\$2/cup	Bag of confetti	\$3/bag

WEEK 3

Each astronaut packs 6 shirts and 3 pairs of pants for the trip. If the astronauts wear 1 pair of pants and 1 shirt at a time, how many different outfits can they wear on the trip? Draw a picture to show your strategy for solving.

WEEK 4

The cockpit floor is 7 feet wide and has a total area of 84 sq. ft. If each of the 7 crew members must have a seat and the seats and equipment have a width of 3 ft., how long can each seat measure from front to back? How long is the cockpit floor? Draw a diagram of the cockpit, showing where the seats could be located.

WEEK 1


Captain Jake's crew is very experienced. The astronauts in this program earn \$75 per day, with an additional \$7 per day for each year of experience. If the senior crew members on the mission have 10, 7, and 5 years of experience, how much money will each of these crew members earn per day? Discuss with a partner how you solved this problem. How are your strategies similar or different?

WEEK 2

These astronauts have a rotating duty schedule that repeats every 10 days. If a crew member prepares breakfast on days 6 and 16, what are the next 2 days that the same crew member will prepare breakfast? The order of duties is as follows: breakfast, laundry, cleaning the cockpit, rest, lunch, trash, sanitizing kitchen utensils, rest, dinner. On what number day will this particular crew member have trash duty? When will be his first rest day? Which duty did he have on day 1 of the mission?

WEEK 3

Specific stars should be more visible from the ship's route in space than from Earth, so 3 crew members are assigned to study them. One crew member collects data about the life cycle of 24 stars, and 2 others study the gravitational field of 48 stars. How many stars will these 3 crew members study altogether? If 1 of the crew who is studying gravitational fields is tracking only 13 stars, how many stars is the crew member who is focusing on gravitational fields studying? Which of the 3 crew members is studying the most stars?

WEEK 4

If the base (or bottom) of the *USS Braxton* is a circle, and the ship is 1 complete three-dimensional shape, what are the possible shapes of the ship? Draw a picture of the shape you think would be best. Discuss the characteristics of this shape with a partner, and explain why it would make a good spaceship.