

Name: _____

Skill Sheet 31-B

Touring the Solar System



What would a tour of our solar system be like? How long would it take? How much food would you have to bring on your tour? In this skill sheet, you will calculate the travel distances and times for a tour of the solar system. Your mode of transportation will be an airplane travelling at 250 meters per second or 570 miles per hour.

1. Planets on the tour

Starting from Earth, the tour itinerary is: Earth to Mars to Saturn to Neptune to Venus and then back to Earth. The distances between each planet of the tour is provided in Table 1. The airplane travels at 250 meters per second or 900 kilometers per hour. Using this rate and the speed formula, find out how long it will take to travel each leg of the itinerary. An example for how to calculate how many hours it will take to travel from Earth to Mars is provided below. For the table, calculate the time in days and years as well.

Example: How many days will it take to travel from Earth to Mars? The distance from Earth to Mars is 78 million kilometers.

$$\text{time} = \frac{\text{distance}}{\text{speed}}$$

$$\text{time to travel from Earth to Mars} = \frac{78 \text{ million km}}{900 \frac{\text{km}}{\text{hour}}}$$

$$\text{time to travel from Earth to Mars} = 86,666 \text{ hours}$$

$$86,666 \text{ hours} \times \frac{1 \text{ day}}{24 \text{ hours}} = 3,611 \text{ days}$$

Table 1: Solar System Trip

Legs of the trip	Distance travelled for each leg (km)	Hours travelled	Days travelled	Years travelled
Earth to Mars	78,000,000			
Mars to Saturn	1,202,000,000			
Saturn to Neptune	3,070,000,000			
Neptune to Venus	4,392,000,000			
Venus to Earth	42,000,000			

2. Provisions for the trip

A trip through the solar system is a science fiction fantasy. Answer the following questions as if such a journey were possible.

1. It is recommended that a person drink eight glasses of water each day. To keep yourself hydrated on your trip. How many glasses of water would you need to drink on the leg from Earth to Mars?

2. An average person needs 2,000 food calories per day. How many food calories will you need for the leg of the journey from Neptune to Venus?

3. Proteins and carbohydrates provide 4 calories per gram. Fat provides 9 calories per gram. Given this information, would it be more efficient to pack the plane full of foods that are high in fat or high in protein for the journey? Explain your answer.

4. You decide that you want to celebrate Thanksgiving each year of your travel. How many frozen turkeys will you need for the entire journey?

3. Planning your trip for each planet

In the student text, there is a table that lists the properties of the nine planets. Use this table to answer the following questions.

1. On which planet, would there be the most opportunities to visit a moon?

2. Which planets would require high-tech clothing to endure high temperatures? Which planets would require high-tech clothing to endure cold temperatures?

3. Which planet has the longest day?

4. Which has the shortest day?

5. On which planet would you have the most weight? How much would you weigh in Newtons?

6. On which planet would you have the least weight? How much would you weigh in Newtons? Use proportions to answer this question.

7. Which planet would take the longest time to travel around?

8. Which planet would require your spaceship to orbit with the fastest orbital speed? Explain your answer.
