

## Measuring The Distance

Lesson 1 of 2

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**Grade Level:** K-4

**Subjects:** Space Science, Mathematics, Technology

**Prep Time:** < 10 minutes

**Activity Duration:** One class period

**Materials Category:** Special requirements

National Education Standards				
Science	Mathematics	Technology		Geography
		ISTE	ITEA	
5b	2b, 6a, 9b, 13d		17a	

**Objective:** To compare the planets Earth and Mars, and to demonstrate the distance between the two planets.

### Materials:

- Two poster board sheets
- One roll of toilet paper
- Crayons/markers
- Student Sheet
- Pencil

### Related Links:

Mars Education

<http://marsnt3.jpl.nasa.gov/education/index-education.html>

Center for Mars Exploration

<http://cmex-www.arc.nasa.gov/>



# Measuring The Distance

Teacher Sheets

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## Background

Mars, the red planet, is the fourth planet from the Sun and the most Earth-like planet in our solar system. It is about half the size of Earth and has a dry, rocky surface and a very thin atmosphere. Traveling to Mars isn't a new idea. We've done it with robots for 25 years. NASA wants to get humans to land on Mars. NASA is looking at different ways of getting a human on Mars.

Mars is about 1,000 times farther away than the Moon is from Earth. A trip to Mars is very complex. In order to have the supplies needed to set up facilities on the planet, multiple trips to Mars will be required. In some cases, several launched vehicles would rendezvous in space and land on Mars as a unit. The timetable for landing on Mars isn't definite, but scientists are hoping that a craft might leave Earth around 2016, land around 2018, and return to Earth in 2020.

## Guidelines

1. Read the K-4 NASAexplores article, "Destination: Mars," and discuss it.
2. Tell the students they are going to look at how far Mars is from Earth and make a model showing this distance.
3. Before they begin, have the students use the Mars/Earth fact sheet to fill in their information cards about Earth and Mars.
4. Discuss how far away each planet is from the Sun, and have the students try to figure how far apart they are from each other (the students should subtract the distance of Earth and Mars from the Sun). Ask the students if any of them can imagine such a distance, making sure you are making clear it is millions of miles.
5. Tell students that we are going to make a model that shows the distance between the planets by using toilet paper. One square in the toilet paper represents 10,000,000 miles. Ask the students: *If Mars is 49,000,000 miles from Earth, how many squares should we count out to represent this distance?* Almost five squares.
6. Discuss how they figured this out.
7. Place the students in two groups. Give each group a poster. One group is assigned Mars and the other group Earth. The groups will illustrate their assigned planet, making sure they show the characteristics of their planets.
8. Hang the posters up in the classroom or hallway, and connect them with the toilet paper to demonstrate the distance the two planets are from each other.

## Discussion / Wrap-up

- Discuss the student's fact sheets, and compare and contrast the two planets.
- Discuss how traveling such distances will require time and how they might try to travel this far.



## Extension(s)

- Have students complete a Venn diagram that compares and contrasts the two planets.
- Have students draw the Sun on poster board, and represent the distance between the Earth and Sun and Mars and Sun, using the toilet paper as a the model for distance.

## Information Sheet

	<b>Earth</b>	<b>Mars</b>
Average Distance from the Sun	93,000,000 miles	142,000,000 miles
Period of Revolution	365.3 days	687 days
Diameter	12,756 km	687 km
Components of the Atmosphere	Nitrogen Oxygen	Carbon Dioxide
Moons	1	2
Rings	0	0
Rotation Period	~24 hours	~24.7 hours



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Student Sheet(s)

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Name \_\_\_\_\_

Use the Information Sheet to fill in the blanks below.

## Mars

Mean distance from the Sun _____ miles
Period of Revolution _____ days
Diameter _____ km
Atmosphere Components _____
Moons _____
Rings _____
Rotation Period _____

## Earth

Mean distance from the Sun _____ miles
Period of Revolution _____ days
Diameter _____ km
Atmosphere Components _____
Moons _____
Rings _____
Rotation Period _____

