Meet the Planets

Soar into the Solar System to witness the first Favorite Planet Competition, emceed by none other than the former ninth planet, now known as dwarf planet Pluto. Who will the lucky winning planet be? Readers learn all about each planet as Pluto announces them with short, tongue-in-cheek facts. Children (of all ages) will spend hours searching the art for all the references to famous scientists and people of history, space technology, constellations, art, and classic literature. It’s so much more than a picture book... this book is specifically designed to be both a fun-to-read story and a launch pad for discussions and learning. Whether read at home or in a classroom, we encourage adults to do the activities with the children in their lives. Free online resources and support for the book at www.ArbordalePublishing.com include:

- For Creative Minds as seen in the book (in English & Spanish):
  - And the Winner Is...
  - Time and Temperatures
  - Distance from Sun: A Place Value Activity
  - Constellations, Famous People, Space Technology
  - Solar System: True or False?
- Teaching Activities:
  - Reading Questions
  - Math
  - Language Arts
  - Geography
  - Science
  - Coloring Pages
- Interactive Quizzes: Reading Comprehension, For Creative Minds, and Math Word Problems
- English and Spanish Audiobooks
- Related Websites
  - Aligned to State Standards (searchable database)
- Accelerated Reader and Reading Counts! Quizzes
- Lexile and Fountas & Pinnell Reading Levels

eBooks with Auto-Flip, Auto-Read, and selectable English and Spanish text and audio available for purchase online.

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Meet the Planets

by John McGranaghan
illustrated by Laurie Allen Klein

John McGranaghan has always been fascinated by outer space and he shares that fascination in a humorous (but educational) way through Meet the Planets and Saturn for My Birthday. John has also written stories and articles for Boys’ Quest Magazine, Pockets Magazine, Columbia Magazine, and local newspapers. He is winner of the 2001 Pockets Fiction Contest. When John isn’t writing, he enjoys sports and spending time with his wife and two boys. John is a school counselor in the Philadelphia suburbs.

Laurie Allen Klein has been a freelance artist for nearly 20 years. Over the last several years, she has worked as the on-staff artist for a marine park, where she does everything from painting life-size sea animal murals, to illustrating children’s activity books. As evident by the extras included in the art, she has combined her love and fascination with outer space (and science fiction) with children’s illustration in Meet the Planets.

Laurie also illustrated Furs and Feathers, Where Should Turtle Be?, Solar Forecast, the award-winning Little Skink’s Tail, and If a Dolphin Were a Fish for Arbordale. Laurie lives in Florida.
Welcome to the first ever, *Favorite Planet Competition.* I’m your host, Pluto, coming to you live from the Solar System inside the beautiful Milky Way Galaxy.

These planets have been around for billions of years. They have been viewed through telescopes and visited by spaceships. And tonight, one will be named the favorite planet!

Without further ado . . . let’s meet the planets!
They’re solid. They’re rocky. They’re close to the sun. Here come the inner planets.
He's a little bigger than Earth’s moon and covered in craters; but make no mistake, he’s all planet. Circling the sun in just 88 Earth days, he’s the fastest moving planet in the Solar System. He’s named after the speedy messenger of the gods; now you see him, now you don’t . . . meet Mercury!
For Creative Minds

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And the Winner is . . .

There are so many fun ways to incorporate math and science skills into learning about the solar system! Please see the free online teaching activities for more solar system fun.

Which planet do YOU think should be the Solar System’s favorite planet? Why?

Ask your friends, family members, and classmates which is their favorite planet.

And the Winner is . . .

Mercury Venus Earth Mars Jupiter Saturn Uranus Neptune

Planets are not to scale.

Time and Temperatures

<table>
<thead>
<tr>
<th>Planet</th>
<th>Revolves around Sun*</th>
<th>Rotates on its axis*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>88 days</td>
<td>59 days</td>
</tr>
<tr>
<td>Venus</td>
<td>225 days</td>
<td>243 days</td>
</tr>
<tr>
<td>Earth</td>
<td>365.25 days</td>
<td>one day</td>
</tr>
<tr>
<td>Mars</td>
<td>687 days</td>
<td>one day</td>
</tr>
<tr>
<td>Jupiter</td>
<td>12 years</td>
<td>10 hours</td>
</tr>
<tr>
<td>Saturn</td>
<td>29 years</td>
<td>10 1/2 hours</td>
</tr>
<tr>
<td>Uranus</td>
<td>84 years</td>
<td>17 hours</td>
</tr>
<tr>
<td>Neptune</td>
<td>165 years</td>
<td>16 hours</td>
</tr>
</tbody>
</table>

*The rounded lengths of time are shown in Earth time measurements.

Our day of 24 hours comes from the approximate amount of time it takes the Earth to rotate (spin) on its axis (a make-believe stick going through the Earth from the North to South Poles).

Our year (365 days) comes from the approximate amount of time it takes the Earth to revolve (orbit) around the Sun. We add a leap day every four years (leap year) to even out the extra fraction.

Find the planet symbol to identify the planet’s average temperature.

How long would a “year” be on other planets and the amount of time it takes them to rotate or revolve?

Do you notice a pattern between inner versus outer planets and the amount of time it takes them to rotate or revolve?

How long would a “day” be on the other planets?

Our months come from the almost 30 days it takes the moon to revolve around the Earth. The first day of a lunar month is the day of the new moon, when the sun and moon rise at approximately the same time. The moon rises about 50 minutes later each day as it goes through its phases.

Food for thought: How long would a “month” be on a planet with no moon or with more than one moon? How would YOU determine how many months or how many days in a month? What would you call them?
Distance From Sun: A Place-Value Activity

Answer the following place-value questions. Answers are upside down at the bottom of the page. For more place value and decimal activities, see the book’s online activities.

1. Which planet’s distance has the highest digit in the ten thousands’ column?
2. Which planet’s distance has the highest digit in the ten millions’ column?
3. Which planet’s distance has the highest digit in the hundred millions’ column?
4. If you were to round to the millions, how far would it be in kilometers to Venus?
5. How many planets are over a billion kilometers from the Sun? Which ones?
6. What place value do you need to look at to tell if Earth or Venus is farther from the Sun?
7. What is the value of the digit “5” in the distance between the Sun and Neptune?

<table>
<thead>
<tr>
<th>Planet</th>
<th>Distance (km)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Earth</td>
<td>149,597,890</td>
</tr>
<tr>
<td>Jupiter</td>
<td>778,412,020</td>
</tr>
<tr>
<td>Mars</td>
<td>227,936,640</td>
</tr>
<tr>
<td>Mercury</td>
<td>57,909,175</td>
</tr>
<tr>
<td>Neptune</td>
<td>4,498,252,900</td>
</tr>
<tr>
<td>Saturn</td>
<td>1,426,725,400</td>
</tr>
<tr>
<td>Uranus</td>
<td>2,870,972,200</td>
</tr>
<tr>
<td>Venus</td>
<td>1,082,089,930</td>
</tr>
</tbody>
</table>

Planet distances are in kilometers.

Solar System True or False Questions

Use information found in the book to answer the following true/false questions. Answers are upside down at the bottom of the page.

1. Plants are at the bottom of our food webs and all life relies on plants for food. The outer planets have thick layers of soil for plants to grow.
2. Living things on Earth need liquid water to drink. All planets have water.
3. Living things on Earth need a safe, comfortable place to live. Temperatures on other planets would not support life as we know it—it would either be too hot or too cold.
4. Living things on Earth need oxygen. Many animals get oxygen through lungs and fish get it through gills. Since oxygen is also found on Mars, things that live on Earth might be able to live there too.
5. A day on Mars would be about the same length as a day on Earth but a day on Jupiter would only be 10 hours.
6. A day on Venus is longer than its year.
7. The inner planets are gaseous and have rings, but the outer planets are rocky.
8. We can only see the moon at night.

Constellations, Famous People, and Space Technology

There are art references in this book to constellations, famous people, space technology, classic books, and even other art. Can you find the art in the book? What are some other things you see in the art? A detailed explanation of what is what and who is who can be found in the book’s online activities.

True/False Answers: 1. False: The outer planets are gas with no soil. 2. False: There may be water on ice on some of the other planets (or on their moons), but scientists have yet to find liquid water on any planets.
Solar System Matching Activity

Can you identify the solar system objects? The answers are upside down on the bottom of the next page.

1. This planet is our home and is the only planet not named after a Greek or Roman god! Just over 70% of the planet’s surface is water, and 97% of that is ocean or saltwater. Two percent is frozen ice or underground freshwater, leaving 1% freshwater from lakes and rivers.

2. It takes this satellite almost 30 days to revolve around the Earth, giving us our months. Depending on where it is in its revolution, we see it in different phases. We might see it during the day, at night, or not at all.

3. Named after the Roman goddess of love and beauty, this planet is too hot for life to survive. It has active volcanoes but no water or moon. It rotates (spins) in the opposite direction from all the other planets, and is about the same size as Earth.

4. The largest planet was named after the Roman king of the gods. Astronomers believe the large red spot is a hurricane-like storm that has been there for over 100 years! This planet has different color bands from different gases, 62 known moons, and rings that are hardly visible.

5. The smallest of the outer planets and the farthest from the sun, this blue-colored planet was named for the Roman King of the sea. We know of 13 moons, the largest of which is called “Triton,” named for the Greek god of the sea. Astronomers think that the dark spots are hurricane-like storms but much, much stronger.

6. This red-planet is often seen at night, without a telescope. The rover mission to study this planet brings a whole new meaning to “Red Rover.” Scientists don’t believe there is water on the planet now but think there was at one time. There is no oxygen on this planet but there is carbon dioxide in the atmosphere.

7. This is the star of our solar system, around which we revolve! It is a medium-sized star but looks so big because it is so much closer to us than any of the billions of other stars. It gives us the heat and light that we need to live. We see it rise in the east in the morning and set in the west in the evening.

Planets are shown in order from the sun and are scaled to size but not to distance. See the free, online teaching activities for a distance-from-the-sun activity.