

The Peppercorn Model  
of The Solar System

The Solar System Mystery Walk is based  
on the *Thousand Yard Model* of the Solar  
System, by Guy Ottewell

<http://www.universalworkshop.com/>



To this the dwarf planets  
have been added, along with “distractor”  
symbols that have nothing to do with the  
planets.

Each planet has a QR code  
that leads to NASA’s  
*Solar System Exploration* website  
(or in some cases to Wikipedia)

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Learn more at  
[peppercorn.spy-hill.net](http://peppercorn.spy-hill.net)

FP2222801

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# Solar System Mystery Walk

by  
Eric Myers

## **Overview**

The main idea of the Solar System Mystery Walk is that your group will travel through a scale model of the solar system marked out using the conventional symbols for the planets.

Each person in the group will carry an envelope marked with the symbol of a planet and containing information about that planet.

When your group reaches a symbol, the person carrying that envelope opens it and reads the contents.

## **Set-Up Ahead of Time**

First, print the slides in this deck, fold in half (and laminate if you wish) and place them each in an envelope marked only with that planet's symbol.

Have ready the everyday objects mentioned for each planet: a walnut, a hazelnut, coffee beans, peppercorns, sewing pins and salt.

Before the walk, start at the Sun and pace out the distance to each planet, and write the symbol on the sidewalk with chalk.

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## Distances (and sizes)

| Solar System Object       | Model Object and Diameter |        | Distance <sup>†</sup> (in AU) | Added Distance | Total Distance |
|---------------------------|---------------------------|--------|-------------------------------|----------------|----------------|
|                           | Object                    | inches | AU                            | yards          | yards          |
| <a href="#">Sun</a> ☉     | a soccer ball             | 8.7"   | 0.00                          |                | 0 yd           |
| <a href="#">Mercury</a> ☿ | a pin head                | 0.030" | 0.39                          | +10 yd         | 10 yd          |
| <a href="#">Venus</a> ♀   | a peppercorn              | 0.075" | 0.72                          | +9 yd          | 19 yd          |
| <a href="#">Earth</a> ⊕   | a peppercorn              | 0.079" | 1.00                          | +7 yd          | 26 yd          |
| <a href="#">Mars</a> ♂    | a pin head                | 0.042" | 1.52                          | +14 yd         | 39 yd          |
| * <a href="#">Ceres</a> ♃ | a grain of salt           | 0.006" | 2.77                          | +32 yd         | 72 yd          |
| <a href="#">Jupiter</a> ♃ | a walnut, or chestnut     | 0.89"  | 5.20                          | +63 yd         | 134 yd         |
| <a href="#">Saturn</a> ♄  | an acorn or hazelnut      | 0.75"  | 9.58                          | +113 yd        | 247 yd         |
| <a href="#">Uranus</a> ♅  | a coffee bean             | 0.318" | 19.20                         | +249 yd        | 497 yd         |
| <a href="#">Neptune</a> ♆ | a coffee bean             | 0.308" | 30.10                         | +281 yd        | 777 yd         |

\*dwarf planet

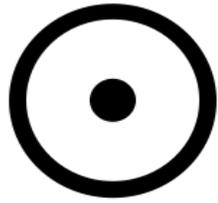
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## Outer Solar System

| Solar System Object          | Model Object and Diameter |        | Distance <sup>†</sup> (in AU) | Added Distance | Total Distance |
|------------------------------|---------------------------|--------|-------------------------------|----------------|----------------|
|                              | Object                    | inches | AU                            | yards          | yards          |
| * <a href="#">Pluto</a> ♇    | a grain of salt           | 0.014" | 34.60                         | +116 yd        | 893 yd         |
| * <a href="#">Haumea</a> ♁   | a grain of salt           | 0.008" | 50.50                         | +410 yd        | 1303 yd        |
| * <a href="#">Makemake</a> ♁ | a grain of salt           | 0.009" | 52.50                         | +53 yd         | 1356 yd        |
| * <a href="#">Sedna</a> ♁    | a grain of salt           | 0.012" | 84.00                         | +812 yd        | 2169 yd        |
| * <a href="#">Gonggong</a> ♁ | a grain of salt           | 0.015" | 88.00                         | +103 yd        | 2272 yd        |
| * <a href="#">Eris</a> ♁     | a grain of salt           | 0.014" | 96.10                         | +209 yd        | 2481 yd        |

\*dwarf planets

The Peppercorn Model of The Solar System



# The Sun

8.7 inches (22.1 cm) across



a soccer ball (or your head)

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# The Sun

The Sun is also known as *Sol*

The Sun is the  
center of the Solar System

It takes light about 500 seconds to  
reach Earth

The Sun is the star  
closest to Earth

Learn more at  
[solarsystem.nasa.gov](https://solarsystem.nasa.gov)



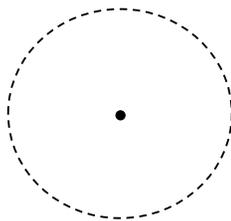
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# Mercury

10 yards from the Sun  
( *0.39 Astronomical Units* )

0.030 inches (0.76 mm) across



a pin head

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# Mercury

Orbital period: 88 days

A single “day” on Mercury takes almost 59 days on Earth

The temperature on Mercury (at the equator) is around 800°F in the daytime, and -280°F at night.

Mercury has no moons

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[solarsystem.nasa.gov](https://solarsystem.nasa.gov)



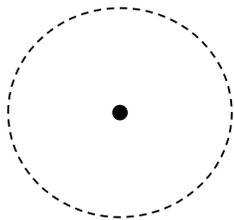
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# Venus

19 yards from the Sun  
( *0.72 Astronomical Units* )

0.075 inches (1.91mm) across



a peppercorn

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# Venus

Orbital period: 225 days

Venus rotates “backwards,” and a “day” on Venus is longer than its year.

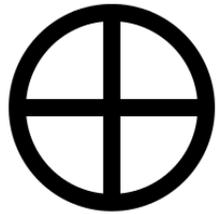
Venus has “phases,” just like the moon (as seen from Earth)

Venus has no moons

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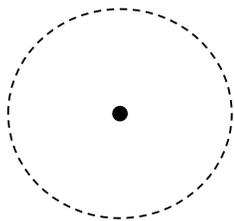
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# Earth

26 yards from the Sun  
( *1.00 Astronomical Units* )

0.079 inches (2.01 mm) across



a peppercorn

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# Earth

Orbital period: 365.25 days

At this scale the Moon is a grain of salt 2.4 inches away (did you feel it?)

Earth has one moon: *Luna*

Earth is the only planet known to have liquid water.

Learn more at  
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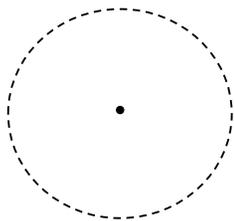
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# Mars

39 yards from the Sun  
( *1.52 Astronomical Units* )

0.042 inches (1.07 mm) across



a pin head

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# Mars

Orbital period: 687 days

One “day” on Mars (called a “sol”)  
is 24.6 hours long.

Mars has two moons:  
*Phobos* and *Deimos*

The atmosphere on Mars is  
96% Carbon Dioxide (CO<sub>2</sub>)

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Dwarf  
Planet

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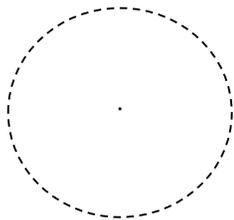
Largest  
Asteroid



# Ceres

72 yards from the Sun  
( *2.77 Astronomical Units* )

0.006 inches (0.15 mm) across



a grain of salt

Dwarf  
Planet

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Largest  
Asteroid

# Ceres

Orbital period: 4.6 years

Ceres was considered a planet  
from 1801 to 1864.  
Now Ceres is classified as  
a “dwarf planet”

Ceres is the largest asteroid  
in the asteroid belt

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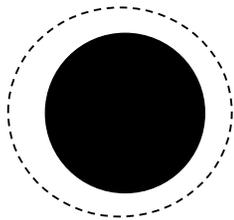
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# 4

# Jupiter

134 yards from the Sun  
( *5.20 Astronomical Units* )

9/10 inch (22.6 mm) across



a walnut or chestnut

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# Jupiter

Orbital period: 11.9 years

Jupiter is a “gas giant” planet,  
but it is too small to be a  
“brown dwarf” star

Jupiter has 95 known moons

Jupiter’s Great Red Spot is a persistent  
storm with wind speeds up to 260 mph.

Learn more at  
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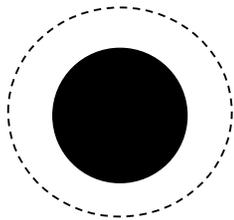
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♄

# Saturn

247 yards from the Sun  
( *9.58 Astronomical Units* )

3/4 inch (19.1 mm) across



an acorn or hazelnut

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# Saturn

Orbital period: 29.5 years

Saturn's rings may be only a  
hundred million years old  
(The solar system is over  
4 billion years old.)

Saturn has 24 "regular" moons  
and 122 "irregular" moons

Learn more at  
[solarsystem.nasa.gov](https://solarsystem.nasa.gov)



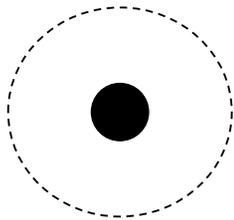
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# Uranus

497 yards from the Sun  
( *19.2 Astronomical Units* )

0.318 inch (8.08 mm) across



a coffee bean

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# Uranus

Orbital period: 84.3 years

The rotation axis of Uranus is tilted sideways compared to the Sun and other planets

Uranus has 27 known moons

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[solarsystem.nasa.gov](https://solarsystem.nasa.gov)



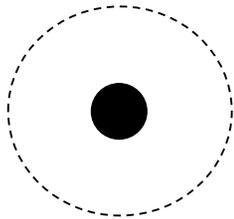
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# Neptune

777 yards from the Sun  
( *30.1 Astronomical Units* )

3/10 inches (7.82 mm) across



a coffee bean

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# Neptune

Orbital period: 165 years

Neptune was first “found” by  
mathematical prediction rather  
than observation

Neptune has 14 known moons

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Dwarf  
Planet

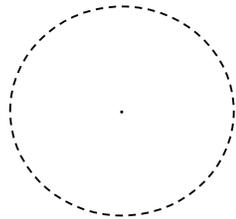
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Kuiper  
Belt

# P Pluto

1014 yards from the Sun  
( *39.3 Astronomical Units* )

0.014 inches (0.36 mm) across



a grain of salt

Dwarf  
Planet

The Peppercorn Model  
of The Solar System

Kuiper  
Belt

# Pluto

Orbital period: 248 years

Pluto has 5 moons: *Charon, Styx, Nix, Kerberos, and Hydra*

Pluto's orbit has an inclination of 17° relative to Earth's orbital plane, and an eccentric orbit.

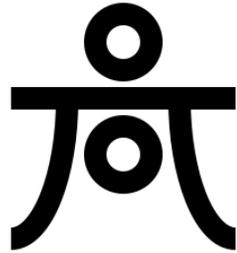
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Dwarf  
Planet

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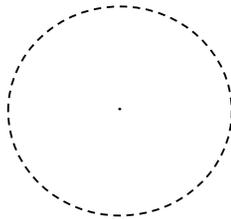
Kuiper  
Belt



# Haumea

1303 yards from the Sun  
( *50.5 Astronomical Units* )

0.008 inches (0.20 mm) across



a grain of salt

Dwarf  
Planet

The Peppercorn Model  
of The Solar System

Kuiper  
Belt

# Haumea

Orbital period: 283 years

Orbital Inclination: 28°

Haumea spins so fast that it is  
oval, not round.

Haumea has 2 moons:  
*Hi'iaka* and *Namaka*

Haumea is named after the  
Hawaiian goddess of fertility

Learn more at  
[solarsystem.nasa.gov](http://solarsystem.nasa.gov)



Dwarf  
Planet

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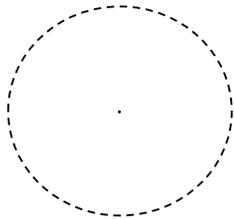
Kuiper  
Belt



# Makemake

1356 yards from the Sun  
( *52.5 Astronomical Units* )

0.009 inches (0.23 mm) across



a grain of salt

Dwarf  
Planet

The Peppercorn Model  
of The Solar System

Kuiper  
Belt

# Makemake

Orbital period: 306 years  
Orbital Inclination: 29°

Makemake is named after the  
fertility god of the Rapanui  
people of Easter Island

Makemake has one moon

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Dwarf  
Planet

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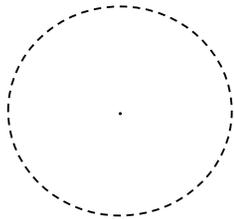
Scattered  
Disk  
Object?



# Sedna

2169 yards from the Sun  
( 84 Astronomical Units in 2022)

0.012 inches (0.30 mm) across



a grain of salt

Dwarf  
Planet

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Scattered  
Disk  
Object?

# Sedna

Orbital period: 11,390 years  
Orbital Inclination: 12°

Sedna gets as close to the Sun as  
76 AU and as far away as 937 AU.

Sedna is named after the Inuit  
goddess of the sea and sea life.

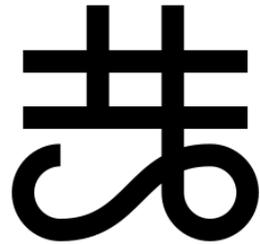
Learn more at Wikipedia:



Dwarf  
Planet

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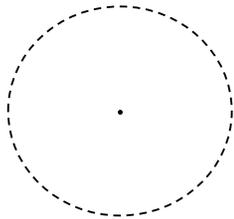
Scattered  
Disk  
Object



# Gonggong

2272 yards from the Sun  
( *88 Astronomical Units in 2019* )

0.015 inches (0.38 mm) across



a grain of salt

Dwarf  
Planet

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Scattered  
Disk  
Object

# Gonggong

Orbital period: 554 years  
Orbital Inclination: 30.7°

Gonggong is about the same size  
as Pluto's largest moon, Charon.

Gonggong has 1 moon: *Xiangliu*

Gonggong is in a 3:10 orbital  
resonance with Neptune.

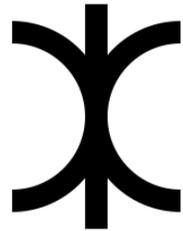
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Dwarf  
Planet

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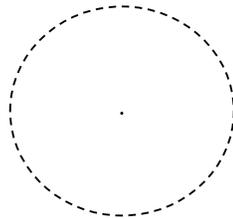
Scattered  
Disk  
Object



# Eris

2481 yards from the Sun  
( *96.1 Astronomical Units* )

0.014 inches (0.36 mm) across



a grain of salt

Dwarf  
Planet

The Peppercorn Model  
of The Solar System

Scattered  
Disk  
Object

# Eris

Orbital period: 559 years  
Orbital Inclination: 44°

Eris is more massive than Pluto,  
but has a slightly smaller volume.

Eris has one moon: *Dysnomia*

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*The Artist Formerly Known as*  
**Prince**



Photo: Richard E. Aaron/Redferns

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# Prince Rogers Nelson

b. 7 June 1958

d. 21 April 2016

Singer, Songwriter, Musician,  
Record Producer

Best known for the songs *Purple Rain*,  
*Little Red Corvette*, *Let's Go Crazy*,  
*Raspberry Beret*, *U Got the Look*,  
*When Doves Cry*, *Kiss*, 1999

Due to a legal dispute with Warner  
Brothers, *Prince* adopted this symbol  
as his stage name from 1993 to 2000.

The symbol was later  
copyrighted as  
*"Love Symbol #2"*



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# Many Trails

A symbol representing the many trails traveled by the Stockbridge-Munsee peoples from their original lands in eastern North America to their current location in Shawano County, Wisconsin.

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# Many Trails

In 1758 the indigenous people of the Hudson Valley, the Munsee clan of the Leni Lenape, agreed to move west, first near Syracuse, then later to Ohio. They joined Mohican and Wappinger people who had first moved to Stockbridge, MA, and the two groups later merged to form the Stockbridge-Munsee tribe.

The Many Trails symbol was created by tribe member and silversmith Edwin Martin in 1965 to symbolize “the endurance, strength, and hope of a long-suffering, proud, and determined people.”

In 1988 the symbol became the official logo of the Stockbridge-Munsee Community.



Dwarf  
Planet

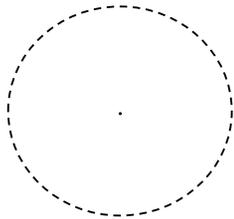
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Scattered  
Disk  
Object?

# Quaoar

1128yards from the Sun  
( 43.7 Astronomical Units)

0.007 inches (0.17 mm) across



a grain of salt

Dwarf  
Planet

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of The Solar System

Scattered  
Disk  
Object?

# Quaoar

Orbital period: 288.8 years

Quaoar is about the same size  
As Pluto's moon *Charon*

Quaoar has 1 known moon,  
called *Weywot*, and two rings  
inside Weywot's orbit

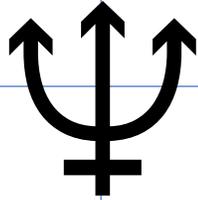
Learn more at Wikipedia:



Dwarf  
Planet

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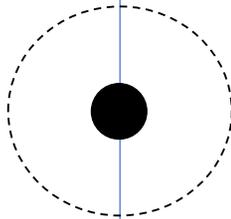
TNO



# Template

xxx yards from the Sun  
( *yy.y Astronomical Units* )

0.zzz inch (w.ww mm) across



An object

Dwarf  
Planet

The Peppercorn Model  
of The Solar System

Scattered  
Disk  
Object

# Template

Orbital period: zzz years  
Orbital Inclination: dd°

Add a memorable fact here

Use this template to make your  
own cards for newly discovered  
objects, or to make distractors.

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