

HurkleQuest in Oregon Game 01

The Hurkle Hiders [Bob & George] • MathBackpacks@aol.com

HurkleQuest in Oregon Game 01 is a play-by-email game played by fourth- and fifth-grade teams in Oregon from 2005-04-17 through 2005-05-11. The teams:

- The Tom McCall Hurkle Hunters
- Ms. Alexander's Class
- Hoisington's Hurklefinders

We sent email invitations to teachers whose students had played **HurkleQuest on the Number Line Game 01** and/or **HurkleQuest in Quadrant 1 Game 01**. The stories of those games are posted in the Play Together, Learn Together section of www.StarshipGaia.net.



- Play Together, Learn Together (<http://www.starshipgaia.net/BobGeorge/PTLT/Default.asp>)

Invitation to Play HurkleQest in Oregon Game 01

Subject: Play HurkleQuest in Oregon by Email

Date: 2005-04-17

Ahoy HurkleQuesters,

Hurkle and the Hurkle Hiders will soon move from Santa Rosa, California to Oregon. In **HurkleQuest in Oregon Game 01**, your task is to find our future home in Oregon. Each turn, send **two guesses** to The Hurkle Hiders: MathBackpacks@aol.com. Each guess is a town, village, hamlet, or city in Oregon.

- Guess #1: Town, village, hamlet, or city in Oregon
- Guess #2: Town, village, hamlet, or city in Oregon

We will calculate the **distance in kilometers** from each of your guesses to our future home in Oregon. This distance is as the Crow, Raven, or Western Meadowlark (Oregon State bird) flies along a **line segment** from your guess to our location. We will send you a color clue for each guess.

RED	Hot, very close to our location
ORANGE	Very warm, close to our location
YELLOW	Warm, not as close as orange, but closer than green
GREEN	Cool, farther than yellow, closer than blue
BLUE	Cold, farther than green, closer than violet
VIOLET	Very cold, way far out from our soon-to-be residence

Our **game board** is the American Automobile Association map of Oregon and Washington.

AAA Oregon/Washington map ISBN 1-56251-992-1

AAA Service Centers (http://www.aaaorid.com/About/about_locations.asp)
Contact an AAA Travel person at 1-800-529-3222 or send email to aautvl@aaaoregon.com.

Each of your guesses must be on the AAA map. When we receive your guesses, we will use a **meter stick** to measure the distance from each of your guesses to our location, use the **map scale** to calculate the distance in **kilometers**, and then **assign a color** to each guess.

Near the lower left corner of the map, there is a **LEGEND**. In the lower right corner of the LEGEND is the map scale: Map scale: **1 : 1,013,760**

One centimeter on the map represents 1,013,760 centimeters in real-world Oregon.

- 1 centimeter : 1,013,760 centimeters or **1 cm : 1,013,760 cm**

Let's convert the scale to **meters** and **kilometers**.

- 1 centimeter : 10,137.60 meters or **1 cm : 10,137.60 m**
- 1 centimeter : 10.13760 kilometers or **1 cm : 10.13760 km**

We don't need all those decimal places, so let's round to the nearest 0.01 kilometer.

- **Our map scale is 1 cm : 10.14 km.**

Here are some distances we measured on the map using a meter stick. These are NOT driving distances. They are measures of **line segments** joining the two locations on the map.

- NW corner of OR to SE corner of OR: 71.0 cm. $(71.0 \text{ cm})(10.14 \text{ km/cm}) = 720 \text{ km}$.
- SW corner of OR to NE corner of OR: 72.1 cm. $(72.1 \text{ cm})(10.14 \text{ km/cm}) = 731 \text{ km}$.
- Salem to Eugene: 9.5 cm. $(9.5 \text{ cm})(10.14 \text{ km/cm}) = 96 \text{ km}$.
- Brookings to Astoria: 45.3 cm. $(45.3 \text{ cm})(10.14 \text{ km/cm}) = 459 \text{ km}$.
- Pendleton to Canyon City: 14.1 cm. $(14.1 \text{ cm})(10.14 \text{ km/cm}) = 143 \text{ km}$.
- Klamath Falls to Bend: 20.3 cm. $(20.3 \text{ cm})(10.14 \text{ km/cm}) = 206 \text{ km}$.
- Lakeview to Burns: 18.4 cm. $(18.4 \text{ cm})(10.14 \text{ km/cm}) = 187 \text{ km}$.
- Ashland to Grant's Pass: 5.5 cm. $(5.5 \text{ cm})(10.14 \text{ km/cm}) = 56 \text{ km}$.

Let the game begin!

The Hurkle Hiders [Bob & George] MathBackpacks@aol.com

The Tom McCall Hurkle Hunters

Turn 01, 2005-04-19. The Tom McCall Hurkle Hunters send their first pair of guesses:

Here are our first guesses:

Lake Oswego
Roseburg

Please write back soon and tell us our clues!

Amy Sanford and the Tom McCall Hurkle Hunters

Turn 01, 2005-04-20. The Hurkle Hiders, happy to begin a new game, reply.

Ahoy Tom McCall Hurkle Hunters,

Great playing with you again! Here are your guesses and clues for **HurkleQuest in Oregon Game 01**.

Guess #1: Lake Oswego Clue: BLUE
Guess #2: Roseburg Clue: BLUE

Data for Oregon cities is from **U.S. Gazetteer** (<http://www.census.gov/cgi-bin/gazetteer>) and **Stats about all US cities** (<http://www.city-data.com/>).

Lake Oswego is in Clackamas County.
Population 35,278 (year 2000). Area: 27 square kilometers. Elevation: 30 meters.
Latitude: 44.07 N. Longitude: 121.31 W

Roseburg is in Douglas County.
Population: 20,017 (year 2000). Area: 24 square kilometers. Elevation: 140 meters.
Latitude: 43.22 N. Longitude: 123.36 W

You are off to a great start -- two BLUE guesses already. Hurkle eagerly awaits your next two guesses.

The Hurkle Hiders [Bob and George]

Turn 02, 2005-04-21. The Tom McCall Hurkle Finders choose a greeting.

Howdy! (We've decided we need our own greeting -- like your "Ahoy!") Here are our next clues:

Hampton
La Grande

Tom McCall Hurkle Hunters

Turn 02, 2005-04-22. The Hurkle Hiders are a bit boggled!

Ahoy Tom McCall Hurkle Hunters,

Your guesses are places we didn't know about! La Grande isn't listed in the index of our map, so we used Google to locate it. Sounds like a great place for hiking and camping. Here are your guesses and clues:

Guess #3: Hampton Clue: VIOLET
Guess #4: La Grande Clue: VIOLET

Hampton is in the western part of Deschutes County, southeast of Bend on Highway 20.
Population: ? Area: ? Elevation: Probably > 1200 meters.
Latitude: 44 N?. Longitude: 120 W?

La Grande is in Union County in northeast Oregon.
Population: 12,327 (year 2000), Area: 11 square kilometers, Elevation: 845 meters
Latitude: 45.33 N. 118.09 W

Two VIOLET guesses -- Hampton and La Grande are far from our soon-to-be new home. Fun locating them on the map. Maybe we'll go there someday, walkabout, and send thanks to you on the wind.

Turn 03, 2005-04-25. The Tom McCall Hurkle Hunters explore ducks and beavers.

Howdy,

Thanks for the clues! Our next guesses are Eugene and Corvallis. Hope we're getting closer! By the way, we're still not working from the official AAA map, but it seems to be working.

Tom McCall Hurkle Hunters

Turn 03, 2005-04-25. The Hurkle Hiders admire quacking, munching on trees, and dam building.

Ahoy Tom McCall Hurkle Hunters,

Aha! Ducks and Beavers. Two academic guesses.

Guess #5: Eugene Clue: GREEN

Guess #6: Corvallis Clue: GREEN

Eugene is in Lane County and is the Home of Oregon University.

Population: 137,893 (year 2000). Area: 105 square kilometers. Elevation: 128 meters.

Latitude: 44.05 N. Longitude: 123.11 W.

Corvallis is in Benton County and is the home of Oregon State University.

Population: 49,322 (year 2000). Area: 35.2 square kilometers. Elevation: 69 meters.

Latitude: 44.57 N. Longitude 123.28 W.

Eugene and Corvallis are in the Willamette Valley, both close to longitude 123. This **meridian** passes through Earth's poles. You are in the GREEN part of Hurkle space, most appropriate for Oregon!.

Turn 04, 2005-04-26 The Tom McCall Hurkle Hunters sense that they are getting close.

Howdy! We're getting close now! Our next guesses are: Toledo and Springfield. Are we closer?

Amy Sanford and the Tom McCall Hurkle Hiders

Turn 04, 2005-04-27. Indeed, the Tom McCall Hurkle Hunters are getting close.

Ahoy Tom McCall Hurkle Hunters,

There is much excitement in Hurkle's hiding place as the Tom McCall Hurkle Hunters bodaciously enter the red zone.

Guess #7: Toledo Clue: RED

Guess #8: Springfield Clue: BLUE

Toledo is on the Yaquina River in Lincoln County.

Population: 3,472 (year 2000). Area: 5.7 square kilometers. Elevation: 18 meters.

Latitude: 44.62 N. Longitude: 123.93 W.

Springfield is in Lane County between the McKenzie and Willamette rivers.

Population: 52,864 (year 2000). Area: 37 square kilometers. Elevation: 139 meters.

Latitude: 44.05 N. Longitude: 122.98 W.

We will soon welcome you to our future home town.

Turn 05, 2005-04-28. The Tom McCall Hurkle Hunters use MapQuest to HurkleQuest.

Howdy! Because we don't have the official map (still) we looked at Mapquest. Our guesses are Elk City and South Beach. Did we get it?

Amy Sanford and the Tom McCall Hurkle Hunters

Turn 05, 2005-04-28. The Tom McCall Hurkle Hunters are in the neighborhood.

Ahoy Tom McCall Hurkle Hunters,

You are definitely in the neighborhood!

Guess #9: Elk City Clue: ORANGE
Guess #10: South Beach Clue: RED

A MapQuest distance is the driving distance – it may bend, jiggle, and wiggle. The distance that we measure on our map is the straight line segment between your guess and Hurkle's hiding place. Our measured distance is less than or equal to the MapQuest driving distance.

Elk City is in Lincoln County and unincorporated. The population data below is from a conversation with a nice person at the Lincoln County Clerk Courthouse. Other data is from the Internet.

Population: 40 to 50. Area: ? Elevation: 90 meters.
Latitude: 44.62 N. Longitude: 123.88 W.

South Beach in Lincoln County is the home of South Beach State Park where you can stay in a yurt and walk to the Hatfield Marine Science Center and Oregon Coast Aquarium..

Population: 1100. Area: ? Elevation: 6 meters.
Latitude: 44.6 N. Longitude: 124.0 W.

Hurkle knows that you will soon arrive and is radiating happiness.

Turn 06, 2005-05-09. The Tom McCall Hurkle Hunters took a break, and then

Sorry we were quiet for so long! I went to a conference and forgot to email the latest guesses. They are:

Moody, Newport

Thanks! Amy Sanford and the Tom McCall Hurkle Hunters

Turn 06, 2005-05-11. Welcome, Tom McCall Hurkle Hunters!

Ahoy Tom McCall Hurkle Hunters,

Bodacious! You've done it. Welcome to the new home of Hurkle and the Hurkle Hiders. We will move to Newport June 11, 2005. Congratulations, Hurkle Hunters. You played very well.

Guess #11: Moody is not on our AAA map.

Guess #12: Newport Clue: HURKLE & HURKLE HIDERS!

Moody is not on our AAA map. Nor is it listed in the US Bureau of Census Gazetteer. It is probably an unincorporated village. A Google search indicated that Moody is on the Deschutes River.

Newport is in Lincoln County and will soon be the home of Hurkle and the Hurkle Hiders.

Population: 9,532 (year 2000). Area: 23 square kilometers. Elevation: 54 meters.

Latitude: 44.62 N. Longitude: 124.05 W.

Thanks for playing HurkleQuest. We will invite you to play HurkleQuest again in September when the 2005-2006 school year begins.

The Hurkle Hiders [Bob & George]

Ms. Alexander's Class

Turn 01, 2005-04-18. Ms. Alexander's Class begins their first HurkleQuest game.

Our Guess #1 is Bend, Oregon

Our Guess #2 is Seaside, Oregon

Turn 01, 2005-04-20. The Hurkle Hiders welcome Ms. Alexander's Class.

Ahoy Ms. Alexander's Class,

Welcome to **HurkleQuest in Oregon Game 01**. Here are your guesses and clues:

Guess #1: Bend Clue: VIOLET

Guess #2: Seaside Clue: BLUE

Data for Oregon cities is from **U.S. Gazetteer** (<http://www.census.gov/cgi-bin/gazetteer>) and **Stats about all US cities** (<http://www.city-data.com/>).

Bend is in Deschutes County.

Population: 52,029 (year 2000). Area: 83 square kilometers. Elevation: 1106 meters.

Latitude: 44.07 N. Longitude: 121.31 W.

Seaside is in Clatsop County.

Population: 5,900 (year 2000). Area: 10 square kilometers. Elevation: 15 meters.

Latitude: 45.99 N. Longitude: 123.92 W.

Good start. You already have a BLUE guess. Hurkle eagerly awaits your next two guesses.

Turn 02, 2005-04-21. Ms. Alexander's Class replies quicky with two new guesses.

Hello Hurkle Hiders, We have 2 more guesses as to where Hurkle is located.

Guess #3 - Salem

Guess #4 - Eugene

Enjoy the move :)

Turn 02, 2005-04-21. The Hurkle Hiders reply on the same day.

Ahoy Ms. Alexander's Class,

We see that you are enjoying a nice trip going south in the beautiful Willamette Valley. Here are your guesses and clues.

Guess #3: Salem Clue: GREEN
Guess #4: Eugene Clue: BLUE

Salem is in Marion County and is the state capital of Oregon. The State Capitol is in Salem.
Population: 136,924 (year 2000). Area: 118 square kilometers. Elevation: 47 meters.
Latitude: 44.92 N. Longitude: 123.02 W.

Eugene is in Lane County and is the home of Oregon University.
Population: 137,893 (year 2000). Area: 105 square kilometers. Elevation: 128 meters.
Latitude: 44.05 N. Longitude: 123.11 W.

You snagged a GREEN guess this time. Good show! You are moving closer to Hurkle's and the Hurkle Hider's soon-to-be new home.

Turn 03, 2005-04-21. Already two more guesses from Ms. Alexander's Class.

Hello Hurkle Hiders, We are going to stay in the beautiful Willamette Valley and our next guesses are closer to home.

Guess # 5 - Portland
Guess #6 - McMinnville

Turn 03, 2005-04-22. The Portland guess triggers a nugget of nostalgia.

Ahoy Ms. Alexander's Class,

One summer a long time ago, Bob and a friend hitchhiked from Iowa to Oregon, worked in a logging camp, and visited Portland on weekends. Here are your guesses and clues:

Guess #5: Portland Clue: BLUE
Guess #6: McMinnville Clue: GREEN

Portland is in Multnomah County and is the largest city in Oregon.
Population: 529,121 (year 2000). Area: 348 square kilometers. Elevation: 15 meters.
Latitude: 45.54 N. Longitude: 122.66 W.

McMinnville is in Yamhill County.
Population: 26,499 (year 2000). Area: 26 square kilometers. Elevation: 49 meters.
Latitude: 45.21 N. Longitude: 123.19 W.

You grabbed another GREEN guess. Think of a "target" centered in our new town. At the center is a solid red circle. Outside that is an orange ring (like a washer). Next is a yellow ring. Beyond the yellow ring is a green ring. You have two guesses in the green ring. Hurkle beckons!

Turn 04, 2005-04-25. Two guesses and a question about the move to Oregon.

Hello Hurkle Hiders,

How is the move going? Our next 2 guesses are:

Guess #7 - Sherwood
Guess #8 - Albany

Ms. Alexander's Class

Turn 04, 2005-04-25. Thanks, the move is going well.

Ahoy Ms. Alexander's Class,

Preparing to move is going well, thank you. We are getting rid of lots of stuff and will carry everything we own to Oregon in a Subaru Forester. Here are your Turn 04 guesses and clues.

Guess #7: Sherwood Clue: BLUE
Guess #8: Albany Clue: GREEN

Sherwood is in Washington County.

Population: 11,791 (year 2000). Area: 11 square kilometers. Elevation: 62 meters.
Latitude: 45.36 N. Longitude: 122.84 W.

Albany is in Linn County.

Population: 40,852 (year 2000). Area: 41 square kilometers. Elevation: 65 meters.
Latitude: 44.62 N. Longitude: 123.09 W.

You have three GREEN guesses in the Willamette Valley: Salem, McMinnville, and Albany, all close to longitude 123. This **meridian** passes through Earth's north and south poles. You will soon move into warmer parts of Hurkle space.

Turn 05, 2005-04-29. Ms. Alexander's Class explores the north and central Willamette Valley.

Our next two guesses are

Guess #9 - Beaverton
Guess #10 - Corvallis

Malinda Alexander

Turn 05, 2005-04-30. The Hurkle Hiders are learning that there are lots of beavers in Oregon.

Ahoy Ms. Alexander's Class,

You must like beavers -- Beaverton and Corvallis, home of the OSU Beavers.

Guess #9: Beaverton Clue: BLUE
Guess #10: Corvallis Clue: GREEN

Beaverton is in Washington County.

Population: 76,129 (year 2000). Area: 42 square kilometers. Elevation: 58 meters.
Latitude: 45.48 N. Longitude: 122.82 W.

Corvallis is in Benton County and is the home of the Beavers of Oregon State University.

Population: 49,322 (year 2000). Area: 35 square kilometers. Elevation: 69 meters.
Latitude: 44.57 N. Longitude: 123.28 W.

Onward to the warmer regions of Hurkle space!

Turn 06, 2005-05-03. Ms. Alexander's Class makes a great move!

Hello there, We have picked 2 more spots.

Guess #11: Dalles
Guess #12: Newport

Ms. Alexander's class

Turn 06, 2005-05-04. Welcome to Hurkle's soon-to-be new home!

Ahoy Ms. Alexander's Class,

Congratulations! You did it. You have found the new home of Hurkle and the Hurkle Hiders. We'll move to Newport June 11, 2005. In your first HurkleQuest game, you played very well.

We can't find Dalles on our map, so we'll guess that you mean Dallas. [Aha! Later we learned about The Dalles on the Columbia River.]

Guess #12: Newport Clue: HURKLE AND THE HURKLE HIDERS!

Newport is in Lincoln County and will soon be the new home of Hurkle and the Hurkle Hiders.
Population: 9,532 (year 2000). Area: 23 square kilometers. Elevation: 54 meters.
Latitude: 44.62 N. Longitude: 124.05 W.

Thanks for playing HurkleQuest. We will invite you to play HurkleQuest again in September when the 2005-2006 school year begins.

The Hurkle Hiders [Bob & George]

Hoisington's Hurklefinders

Turn 01, 2005-04-21. Hoisington's Hurklefinders begin HurkleQuest in Oregon Game 01.

Howdy! Our first two guesses are:

Wilsonville
Sunriver

Thanks, Hois' Hurklefinders

Turn 01, 2005-04-21. Hurkle is happy that Hoisington's Hurklefinders are playing again.

Ahoy Hoisington's Hurklefinders,

Welcome to **HurkleQuest in Oregon Game 01**. Greate fun to play with you again. Here are your guesses and clues.

Guess #1: Wilsonville Clue: BLUE
Guess #2: Sunriver Clue: VIOLET

Data for Oregon cities is mostly from **U.S. Gazetteer** (<http://www.census.gov/cgi-bin/gazetteer>) and **Stats about all US cities** (<http://www.city-data.com/>).

Wilsonville is in Clackamas County. It is famous for being the home town of Hoisington's Hurklefinders.
Population: 13,991 (year 2000). Area: 17 square kilometers. Elevation: 43 meters.
Latitude: 45.31 N. Longitude: 122.77 W.

Sunriver is an unincorporated community in Deschutes County.
Population: 1700. Area: ?. Elevation: 1271 meters (high desert).
Latitude: 43.88 N. Longitude: 121.44 W.

Good start, Hurklefinders -- a BLUE guess in Turn 01. Hurkle eagerly awaits your next two guesses.

Turn 02, 2005-04-26. New guesses and a question about "interesting projects relating to space."

I talked to Ginger Redlinger, an ODE math educator who used to work in our Wilsonville school district. She mentioned that you worked as engineers at or near NASA in the past. Not to pry, but we are curious if you worked on any interesting projects relating to space! Our second guesses are:

Corvallis
Tillamook

Thanks, Hois' Hurklefinders

Turn 02, 2005-04-27. The Hurkle Hiders digress a bit into space science.

Ahoy Hoisington's Hurklefinders,

Two GREEN guesses this time. You will soon explore warmer regions of Hurkle space.

Guess #3: Corvallis Clue: GREEN
Guess #4: Tillamook Clue: GREEN

Corvallis is in Benton County and is the home of the Beavers of Oregon State University.
Population: 49,322 (year 2000). Area: 35 square kilometers. Elevation: 69 meters.
Latitude: 44.57 N. Longitude: 123.28 W.

Tillamook is in Tillamook County near Tillamook Bay and is famous for Tillamook cheese.
Population: 4,352 (year 2000). Area: 4 square kilometers. Elevation: 5 meters.
Latitude: 45.46 N. Longitude: 123.84 W.

You asked about space projects. Bob worked as a mathematician in an aerospace "think tank" a long time ago. Since 1993, Bob & George have been involved in many space projects in schools. Would you and your students like to explore the Solar System and design/simulate Missions to Mars with us?
Email us: StarshipGaia@aol.com.

Turn 03, 2005-04-28. Hoisington's Hurklefinders move toward the Oregon coast.

We're getting closer to the coast! Our next choices are:

Lincoln City
Willamina

Thanks, Hois' Hurklers

PS I would be very interested in your Mars project. I'd love to hear more about it.

Turn 03, 2005-04-28. Ah! Hoisington's Hurklefinders hear the sound of the ocean.

Ahoy Hoisington's Hurklefinders,

Your guesses are on or near the coast. Enjoy the clean salt air and the ocean beaches.

Guess #5: Lincoln City Clue: YELLOW

Guess #6: Willamina Clue: GREEN

Lincoln City is in Lincoln County on the Oregon Coast.

Population: 1844 (year 2000). Area: 2.3 square kilometers. Elevation: 1 meter.

Latitude: 44.97 N. Longitude: 124.01 W.

Willamina is in Yamhill County about 40 kilometers from the Oregon Coast.

Population: 1844 (year 2000). Area: 14 square kilometers. Elevation: 68 meters.

Latitude: 45.08 N. Longitude: 123.48 W.

Soon you will home in on Hurkle's hiding place. In September 2005, we'll send email with ideas for Solar System and Mars investigations and projects from email address StarshipGaia@aol.com.

Turn 04, 2005-05-03. Hoisington's Hurklefinders are meandering down the coast.

Hello, soon-to-be Oregon Hurklehidrs! Our next two guesses are:

Newport

Siletz

We are enjoying our mental wanderings down the Oregon Coast. Thanks,
Hois' Hurklefinders

Turn 04, 2005-05-05. Hoisington's Hurklefinders meander into Hurkle's soon-to-be home town.

Ahoy Hoisington's Hurklefinders,

Zounds! You've done it again. Welcome to the future home of Hurkle and the Hurkle Hiders. We will move to Newport June 11, 2005. Congratulations, Hurklefinders. You played very well.

Guess #7: Newport Clue: HURKLE & HURKLE HIDERS!

Guess #8: Siletz Clue: ORANGE

Newport is in Lincoln County and will soon be the new home of Hurkle and the Hurkle Hiders.

Population: 9,532 (year 2000). Area: 23 square kilometers. Elevation: 54 meters.

Latitude: 44.62 N. Longitude: 124.05 W.

Siletz is in Lincoln County and is the home of the Consolidated Tribes of Siletz Indians.

Population: 1,133 (year 2000). Area: 1.6 square kilometers. Elevation: 40 meters.

Latitude: 44.72 N. Longitude: 123.92 W.

Thanks for playing HurkleQuest. September 2005 we will send email inviting you to play more HurkleQuest games.

The Hurkle Hiders [Bob & George]

What Do the Colors Mean?

You can be a Hurkle Hider and run a HurkleQuest game. Use our distances and their colors or invent your own. The distances and colors that we used in **HurkleQuest in Oregon Game 01** are shown below.

D = distance of a guess from Hurkle's hiding place in kilometers (km).

0 km < D ≤ 10 km	RED
10 km < D ≤ 15 km	ORANGE
15 km < D ≤ 52 km	YELLOW
52 km < D ≤ 96 km	GREEN
96 km < D ≤ 192 km	BLUE
192 km < D	VIOLET

The numbers are based on the distances from the Sun of the planets Earth, Mars, Jupiter, Saturn, and Uranus, measured in **astronomical units (AU)**,

- 1 astronomical unit (AU) = mean distance of Earth from the Sun
- 1 AU = 149.60 million kilometers

The distances of the planets from the Sun in astronomical units (AU), rounded to 0.1 AU, are:

- Earth 1.0 AU
- Mars 1.5 AU
- Jupiter 5.2 AU
- Saturn 9.6 AU
- Uranus 19.2 AU

Using a **scale of 10 km : 1 AU**, we drew circles centered on Newport on the map, and put a color marker in each region.

The map scale is 1 cm : 10.14 km, or 0.0986 cm : 1 km, so the radii of our circles in centimeters are:

- Earth: $(1.0 \text{ AU})(10 \text{ km/AU})(0.0986 \text{ cm/km}) = 0.986 \text{ cm}$. Round to 1.0 cm.
- Mars: $(1.5 \text{ AU})(10 \text{ km/AU})(0.0986 \text{ cm/AU}) = 1.479 \text{ cm}$. Round to 1.5 cm.
- Jupiter: $(5.2 \text{ AU})(10 \text{ km/AU})(0.0986 \text{ cm/km}) = 5.128 \text{ cm}$. Round to 5.2 cm.
- Saturn: $(9.6 \text{ AU})(10 \text{ km/AU})(0.0986 \text{ cm/km}) = 9.467 \text{ cm}$. Round to 9.5 cm.
- Uranus: $(19.2 \text{ AU})(10 \text{ km/AU})(0.0986 \text{ cm/km}) = 18.93 \text{ cm}$. Round to 18.9 cm.

Hey Hurklehidiers, invent **your** distance-color relationship and draw circles on **your** map.

We are ready to play. Hide Hurkle and tell us when and where to send our first guesses.

Bob & George
MathBackpacks@aol.com