Title: Astronomer Speed Dating

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Date/Time Lesson to be taught: October 3, 2022

Course Description:

Name: Astronomy

Grade Level: Mixed Grade

Honors or Regular: Regular

Concept Statement:

Astronomers like Aristotle, Aristarchus, Hipparchus, Ptolemy, Copernicus, Brahe, Galileo, Einstein, Kepler, Newton, Sagan, Kaku, Van Allen, Rubin, Leavitt, and Hawking have contributed to science through theories and laws that guide modern space exploration.

Lesson Objectives:

Students will be able to recall notable astronomers and their contributions.

Virginia Standards of Learning:

ES. 3 Students will investigate and understand the characteristics of Earth and the solar system.

Key concepts include:

d) the history and contributions of space exploration.

Materials List and Advanced Preparations:

Warm Up (on back of profile)

Astronomer slips (1 per student)

Astronomers fill in the blank fact sheet (2 pages front and back per student)

Astronomer Dating Profile sheet (1 per student)

Exit Ticket (on back of profile)

Safety Concerns:

If using online sources to aid in fact sheet information, ensure responsible and accurate sites are being used.

ENGAGEMENT		Time: 10 mins
What the Teacher & Students Will Do	**Probing/Eliciting Questions**	**Student Responses & Misconceptions**
Teachers will greet students as they walk into class.		
When students are seated and ready to begin, Mr. H will get students' attention and explain the Warm-Up activity.	"Why do we study astronomers?" "How do they relate to modern astronomy?' "Who is currently your favorite astronomer?"	Each astronomer built knowledge on what the previous generation did, there was no single contributor to the theory of the universe. Modern astronomy is based on the principles that these old bearded dudes collaborated on over centuries of study.
Ms. Gradel will hand out "Dating Profile" laid upside down on the students table and instruct students to write their answers here and not to turn over yet during Mr. H's explanation.		
Students will complete the warm up activity independently on the back page handed out by Ms. Gradel. Students may chat with peers - ensure this is independent.	Ask students to put pencil's down when finished. "Leave room for an exit ticket"	
Evaluation/Decision Point Assessment		**Student Outcomes**
When pencils are down and Teachers notice that everyone has completed the activity, they will instruct students to flip over the sheet to reveal the "Dating Profile" activity.		Students will be refreshed on astronomers they already learned.

EXPLORATION		Time: 8-10 mins
What the Teacher & Students Will Do	**Probing/Eliciting Questions**	**Student Responses & Misconceptions**
Ms. Gradel will ensure students have flipped the page to reveal activity on the front.		
Ms. Gradel will explain the topic and procedure for the lesson. Mr. H will hand out slips and fill in sheets during this.	"Complete your dating profile with information found on your slip and or prior knowledge."	
Students will receive their astronomer and begin filling in their "profile".	"What do you already know about your astronomer? Include this in your "Facts About Me" box."	
Mr. H will explain how students will be rotating to receive all the information needed.		
Evaluation/Decision Point Assessment		**Student Outcomes**
When students appear all done filling out their profile with their given astronomer, Mr. H will have students set up in their appropriate areas for rotation time.		Students will have a complete filled in dating profile ready for speed dating.

EXPLANATION		Time: 45 mins
What the Teacher & Students Will Do	**Probing/Eliciting Questions**	**Student Responses & Misconceptions**
Teachers will tell students they have 3 minutes per date. Teachers will also run a practice round of the rotations to ensure students know where to move when the timer is up.	"You need to share your information with each other in 3 minutes. Do not worry if you can't get everything on the other's profile. Get as much as you can.."	
Teachers will put timers on the board and ensure students understand their job and are ready to start.	"Would someone please explain and/or demonstrate how the rotational flow will go?" "point in the next direction you are moving"	Students will point in the direction which they are supposed to rotate.

EXPLANATION		Time: 45 mins
What the Teacher & Students Will Do	**Probing/Eliciting Questions**	**Student Responses & Misconceptions**
Students will start "dinner time" and begin their rounds with the other astronomers.		
Teachers will facilitate during this period and maintain dinner etiquette. Students may not rotate properly. Facilitate this part closely.		
Evaluation/Decision Point Assessment		**Student Outcomes**
All rounds will be complete and students should have a completed list of facts from each of their dates. Teachers will instruct students to come back to their seats.		Students will have a full sheet with facts of all astronomers.

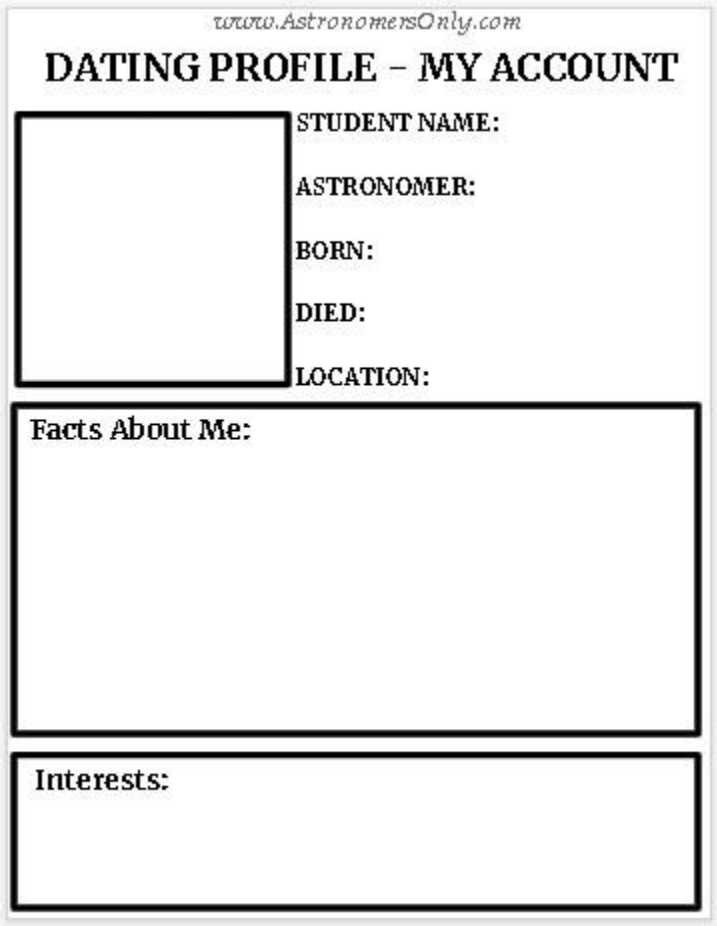
ELABORATION		Time: 10 mins
What the Teacher & Students Will Do	**Probing/Eliciting Questions**	**Student Responses & Misconceptions**
Teachers will open the floor to the students and ask questions about their activity. Will wait for students to speak - if silent will call on students randomly. Mr. H will share an interesting fact about Tycho Brahe and Carl Sagan. "An enormously rich 16th century Danish astronomer, who had a pet moose that accompanied him everywhere and developed a taste for beer. The moose became so intoxicated at a party that it fell down the stairs and died	"While getting to know the other astronomers, tell me one new thing you learned." "Which astronomer or multiple do you feel contributed the most to increase our understanding of astronomy?"	Why would Brahe let Wilhelm drink beer? (answers may vary depending on the astronomer)

ELABORATION		Time: 10 mins
What the Teacher & Students Will Do	**Probing/Eliciting Questions**	**Student Responses & Misconceptions**
from subsequent injuries. Poor Wilhelm."		
Carl Sagan, sued Apple Computer in 1995. Apple used 'Carl Sagan' as an internal code for the Power Macintosh 7100. After a cease-and-desist letter, Apple renamed it 'BHA', for Butt Head Astronomer. Sagan sued. Apple then changed the name to "LAW", short for "Lawyers are Wimps".		Why is Apple so petty?
Evaluation/Decision Point Assessment		**Student Outcomes**
After 10 minutes of open conversation amongst the class, teachers will be satisfied with understanding of students and levels of participation.		Students will have wrapped up knowledge and have learned fun facts about notable astronomers .

EVALUATION		Time: 10 mins
What the Teacher & Students Will Do	**Probing/Eliciting Questions**	**Student Responses & Misconceptions**
Ms. Gradel will instruct students to go back to the page with their warm up on it.		
Students will get their pencils and sheets ready to answer an exit ticket.		
Teachers will explain the exit ticket (displayed on a smart board).	"Which of the 16 astronomers would you most like to take on a date?"	

EVALUATION		Time: 10 mins
What the Teacher & Students Will Do	**Probing/Eliciting Questions**	**Student Responses & Misconceptions**
Students will independently complete exit ticket questions.	"Please hand in all of your work from today before leaving the classroom."	
Evaluation/Decision Point Assessment		**Student Outcomes**
Teachers will collect all materials from students after they finish their exit ticket and before they leave the classroom.		Students will be able to share facts and understand the contributions from notable astronomers.

Attach any SUPPLEMENTARY MATERIALS (handouts, worksheets, data collection tables, assessments, etc.) as part of your lesson plan.



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DATING PROFILE – MY ACCOUNT

STUDENT NAME:

ASTRONOMER:

BORN:

DIED:

LOCATION:

Facts About Me:

Interests:

Name: _____ Date: _____

Astronomer	Information
 Aristotle	
 Aristarchus	
 Hipparchus	
 Ptolemy	

Aristotle (384-322 B.C., Greek), the great philosopher, proved that the Earth is spherical, and believed that it was at the center of the universe. His reason for believing this was actually quite scientific: he knew that if the Earth revolved around the Sun, then we should see the stars shift position throughout the year. Since he did not have the technology to detect this shift, as we do today, he concluded that Earth must rest at the center of the universe. According to him, the Sun, planets, and stars were located in spheres that revolved around the Earth.

Aristarchus (310-230 B.C., Greek) was the first to put forward the idea that the Sun was actually in the center of the universe. His theory was considered far too radical. Unfortunately, history tends to forget that he came to this conclusion about 1,750 years before Copernicus did! He also attempted to measure the relative distances between the Earth and the Sun and the Earth and the Moon. Even though he used a reasonable method, his results were not very accurate, because he lacked the technological equipment to make a precise measurement.

Hipparchus (190-120 B.C., Greek) is widely considered to be the greatest astronomer of ancient times. He compiled the first known star catalog to organize astronomical objects, and also came up with a scale to define the brightnesses of stars. A version of this magnitude system is still used today. He measured the distance from the Earth to the Moon to be 29.5 Earth diameters (we know today that the real value is 30 Earth diameters). Perhaps his greatest discovery was the precession, or wobble, of the Earth's axis, which is caused by the gravitational pull of the Sun and Moon.