Gustav Holst’s

The

Planets

Delaware Symphony Orchestra
Explorer Concerts
April 26, 2012

Teacher Study Guide
An integrated approach
Grades 4-8

Written by Katie Martinenza
Dear Fellow Music Educators and Classroom Teachers,

I am thrilled to have had the opportunity to write and compile this study guide to help prepare your students for the Delaware Symphony Orchestra’s spring Explorer Concert. I have enjoyed researching and learning more about this magnificent piece of music!

I understand our students have a wide range of abilities. I encourage you to tailor the activities in this guide to meet the needs of your students.

The study guide is broken into four lessons with supplemental materials found in the appendix. I am sensitive to the fact that we all have different time restraints and see our classes at different frequencies. I have designed the lessons in a way that no one lesson is dependent upon the other. This way, if you can only afford to devote time to 2 of the 4 lessons, you can select the ones that you feel are most important.

I teach music for grades 1-5 and include a variety of activities in my lessons. In my classroom you’ll find us moving, singing, playing the instruments, composing, and improvising.

This lesson guide takes an integrated approach, making these lessons accessible and user-friendly to classroom teachers as well. If you are a music teacher using these plans, please feel free to add more music making. I also attempted to gear the lessons/activities to upper elementary/middle school-aged students, since the show is for grades 4-8.

I hope you find this study guide helpful and educational as you prepare your students for the show.

Please refer to the website provided by the DSO for listening excerpts:

http://www.desymus.org/ExplorerConcert/Explorer_2011-12_Holst.html

This study guide was designed to coordinate with the excerpts on that website.

Some lessons reference using whole movements. Many public libraries have the CD and there are many recordings available on iTunes and Amazon for a very reasonable price.

Have fun!

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## Notes

- The following abbreviations are used in this lesson plan:
  - T refers to Teacher
  - S refers to Students

- I have created a Notebook file for the Smart Board that can be used as a visual guide through this study guide. I have also added a PDF of this document in case you do not have the Notebook software.
  - Or follow these steps: type this website in your browser http://www.olivebloss.org/ click on Classes, then Related Arts, then Music-Mrs. Martinenza, then Katie Martinenza, then select the DSO Explorer Concert Guide web page.
  - If you have any questions please contact me. 😊
Music
Standard 5: Reading and notating music.
Standard 6: Listening to, analyzing, and describing music.
Standard 7: Evaluating music and music performances.
Standard 8: Understanding relationships between music, the other arts, and disciplines outside the arts.
Standard 9: Understanding music in relation to history and culture.

Visual Arts
Standard 6: Making connections between visual arts and other disciplines.

Physical Education
Standard 5: Exhibits responsible personal and social behavior that respects self and others in physical activity settings.

ELA
Informational Text: Key Ideas and Details
College and Career Readiness (CCR) Anchor Standard 1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
CCR Anchor Standard 2: Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.
CCR Anchor Standard 3: Analyze how and why individuals, events, and ideas develop and interact over the course of a text.

Integrate & Evaluate Content
CCR Anchor Standard 7: Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

Comprehension and Collaboration
College and Career Readiness (CCR) Anchor Standard 1: Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.
CCR Anchor Standard 2: Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
CCR Anchor Standard 4: Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
CCR Anchor Standard 5: Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

Science
Standard 1: Nature and Application of Science and Technology
Standard 4: Earth in Space

Math
Standard 1: Make sense of problems and persevere in solving them.
Standard 5: Use appropriate tools strategically.
About *The Planets*

*The Planets* (Op.32) is a seven-movement orchestral suite written by Gustav Holst between 1914 and 1916. The first complete public performance of *The Planets* took place in London on November 15, 1920, with the London Symphony Orchestra conducted by Albert Coates.

Each movement of the suite is named after a planet in the solar system and its corresponding astrological character as defined by Holst. While you might think Holst was thinking about the solar system when he wrote *The Planets*, he was actually thinking about astrology. He was an amateur astrologer and based each movement of the work on what astrologers thought about the planets and the Roman God associated with each planet.

The planets that Gustav Holst uses in his work are:
1. Mars, the Bringer of War
2. Venus, the Bringer of Peace
3. Mercury, the Winged Messenger
4. Jupiter, the Bringer of Jollity
5. Saturn, the Bringer of Old Age
6. Uranus, the Magician
7. Neptune, the Mystic

All planets are represented with the only exceptions being Earth (which is not observed in astrological practice) and Pluto (which had yet to be discovered at the time of composition and has since been deemed a “dwarf planet”).

*The Planets* is written in a musical style called Romantic. One feature of Romantic music is the use of a large orchestra with many instruments. Holst wrote *The Planets* to include some instruments not often heard in an orchestra such as the bass oboe, contra bassoon, bass clarinet, celesta, organ, and lots of percussion.

The influence of Stravinsky and Schoenberg is very prominent in *The Planets*. In 1913, Stravinsky premiered *The Rite of Spring*, sparking riots in Paris and caustic criticism in London. A year later, Holst first heard Schoenberg’s *Five Pieces for Orchestra*, an “ultra-modern” set of five movements employing “extreme chromaticism” (the consistent use of all 12 musical notes). Although he had earlier lampooned the stranger aspects of modern music, the new music of Stravinsky and Schoenberg influenced Holst’s work on *The Planets*.

Some contemporary composers have used themes from *The Planets* in music you may have heard. Music from *The Planets* can be heard in *Star Wars Episode VI: Return of the Jedi*, at the beginning of the scene when Luke Skywalker is trying to get Darth Vader into a shuttle craft and off the Death Star, which is on the verge of destruction. The theme from the Jupiter movement was used in a TV commercial for Reese’s peanut butter cups in 2007.
About Gustav Holst

Gustav Holst was born in England in 1874. He died in 1934. As a child, he learned to play the piano, the organ, and the trombone. His family was very musical. His father played the piano and his mother was a singer. Gustav Holst studied music composition at the Royal College of Music in London and later taught there. He was also a professional trombonist. In 1904, he began teaching at St. Paul's Girls' School in Hammersmith. Because he was busy teaching, it took him 2 years to write *The Planets*.

In 1895, while attending the Royal College of Music in London on a scholarship, he met fellow student and lifelong friend Ralph Vaughan Williams, whose own music was quite different from Holst’s, but whose praise for his work was abundant. Holst’s music is well known for its unconventional use of meter and haunting melodies, which are especially present in *The Planets*. The two men shared an interest in the English vocal and choral tradition (folk song, madrigals and church music). Holst had hoped to partly build his career as a pianist, but stricken with a nerve condition that increasingly affected the movement of his right hand from adolescence; he eventually gave up the piano for the trombone.

During the first two decades of the 20th century, musical society as a whole (and Holst’s friend Vaughan Williams in particular), became interested in old English folksongs, madrigal singers, and Tudor composers. Holst shared in his friend’s admiration for the simplicity and economy of these melodies, and their use in his compositions is one of his music’s most recognizable features. This influence is clearly heard in Holst’s compositions for wind band, his two Suites for Military Band. These works, though relatively small in number, guaranteed him a position as the medium’s cornerstone, as seen in innumerable present-day programs featuring his two Suites for Military Band. These may be recognizable to students involved in wind ensembles.

Possible Activity:

In small groups, read the biographical information and make 3-5 key points. This could be used as a group activity or sharing activity for the class.
**VOCABULARY LIST & DEFINITIONS**

- **Baton** - A thin tapered rod used by a conductor to lead an orchestra or choir.

- **Brass** - The principal orchestral instruments of the brass family, from highest to lowest, are: trumpet, French horn, trombone and tuba. Other brass instruments commonly used in concert and marching bands include cornet and euphonium. These instruments all have cup-shaped mouthpieces attached to a length of metal tubing that flares into a bell at the end. A column of air is set vibrating by the tightly stretched lips of the player.

- **Concertmaster** - The concertmaster/mistress (from German Konzertmeister) is the leader of the first violin section of an orchestra.

- **Conductor** - Person who, by means of gestures, leads performances of musical ensembles, especially orchestras, bands or choruses.

- **Percussion** - Instrument made of metal, wood, stretched skin or other material that is made to sound by striking, shaking, scraping or plucking. The many varied percussion instruments fall into two basic categories: pitched (such as timpani and xylophone) and unpitched (snare drum, bass drum, cymbals, triangle, tambourine).

- **Strings** - The members of the string family include two types of instruments: bowed and plucked. The standard bowed string instruments, from highest to lowest, are violin, viola, cello and double bass. The harp and guitar are common plucked string instruments. String instruments often play special effects, including trill, pizzicato, harmonic, and arpeggio.

- **Symphony** - An extended piece of music in three or more movements written for symphony orchestra.

- **Theme** – The melodic subject of a musical composition.

- **Woodwinds** - The woodwind family is less homogeneous in construction and sound production than the strings; it includes the piccolo, flute, oboe, English horn, clarinet and bassoon. The saxophone is a more recent woodwind instrument that is frequently heard in jazz.
LESSON #1 – Our Solar System

- **Materials:**
  - Question Worksheets
    - Make copies of the question sheet (APPENDIX A)
    - Each student will need his/her own copy.
  - 16 Solar System/Holst Cards (APPENDIX B)
  - Tape and Scissors
  - Pencils

- **Vocabulary:**
  - Solar System
  - Planets

- **Essential Question(s):**
  - What are the nine planets in our solar system, their order, and a key characteristic of each one?
  - How do music and history influence each other?
  - What inspires someone to create a piece of music?

- **Activating Strategy:**
  - Solar System/ Holst Scavenger Hunt
  - There is a Solar System Scavenger Hunt found at: [http://www.superteacherworksheets.com/space/solarsystem-scav-hunt_WMTTD.pdf](http://www.superteacherworksheets.com/space/solarsystem-scav-hunt_WMTTD.pdf), but this scavenger hunt does not include any facts about the solar system.

- **Procedure/Teaching Strategies:**
  - Hide the fact cards around your classroom where kids will be able to find them. You can stick them on your computer keyboard, on the whiteboard, chalkboard, on the sides of student desks, on chairs, on the chalkboard, on the back of your classroom door, walls, or wherever you like.
  - Give S a copy of the question worksheet. (APPENDIX A) They have to search the room and find all of the fact cards to answer the questions.
  - After they have completed the question sheet, you can go over the answers together with the class using the smart board.
• **Summarizing Strategies/Check for Understanding:**
  - S answer Lesson Essential Question

• **Accommodation/Differentiation ideas and tips:**
  - You may want to make the scavenger hunt a silent activity so students don't share answers with each other.
  - You can have the kids work alone or with a partner.
  - Don't be afraid to hide the facts in “tough” places. Kids think it's more fun when they have to search around a little.
  - Examples of good hiding spots might include:
    - the back of the classroom door
    - laying flat on the bookshelf
    - on the side of your computer monitor
  - Have a plan for students who finish early. You may want to have an assignment for them to complete when they're done, or you may have them help other students find fact cards.

**Additional Activities**

- In even groups students will research one of the seven planets within the suite to create a tourism brochure for visitors traveling to that planet.

- If your school has a computer lab, students could conduct a web search to answer the questions below. If not, a one page planet bio could be distributed.
  - Here is a web search that is already set up: [http://www.nisk.k12.ny.us/birchwood/links/scavengerFacts/solarsystem_thirdgardenew.html](http://www.nisk.k12.ny.us/birchwood/links/scavengerFacts/solarsystem_thirdgardenew.html)
  - Planet facts sheets can printed from one of the following websites:
    - [http://kids.nineplanets.org/intro.htm](http://kids.nineplanets.org/intro.htm)

Students are responsible for finding the following information:
(Feel free to omit or add as you see necessary)
1. Orbit, diameter, mass, volume (in metric)
2. Any mythology
3. History (When was it discovered? Who discovered it?)
4. What materials is the planet made of?
5. What does it look like? (Include pictures and descriptions)
6. Are there any words that describe the planet that you don’t know? What are they? Define them.
7. Any other interesting information that you may run across

- Develop an alien that could inhabit your planet. What would it look like? What does your planet have, or not have, that would contribute to vital alien characteristics?
LESSON #2 – (1) Mars, the Bringer of War & (2) Venus, the Bringer of Peace

- **Objective:** This activity is designed to introduce students to the movements Mars and Venus and to give students the experience of conducting one of the pieces from the concert. Students will start by echo clapping rhythms in 5/4 time. Following a listening map for Mars will allow students to become familiar with additional themes and instruments used in this piece. Conducting Mars from *The Planets* will allow students to gain a kinesthetic understanding of the 5/4 time feel and a better understanding of the role of an orchestral conductor. The listening activity will allow students to compare and contrast two pieces from *The Planets* discussing similarities and differences in music.
  - *Please Note: This lesson could easily take more than one class period.*

- **Prior Knowledge and Skills:** Students should already be introduced to basic conducting technique as well as basic 2/4, 3/4, and 4/4 beat patterns.

- **Materials:**
  - Rhythm instruments (such as rhythm sticks or egg shakers)
  - Smart board

- **Vocabulary:**
  - Conductor
  - Time signature
  - Meter
  - Asymmetrical
  - Rhythm
  - Ostinato
  - Compare
  - Contrast

- **Essential Question(s):**
  - What do the numbers in a time signature mean?
  - How can we show the meter of Mars?
  - Why is it important for musicians to learn to read music or understand musical notation?
  - How can we compare and contrast two pieces of music?

- **Activating Strategy:**
  - Rhythm echo between Teacher and Students
• **Procedure/Teaching Strategies:**
  - Teacher asks students to echo various rhythms patterns in 5/4 meter. (This can be done on a neutral syllable “bah” or using rhythm syllables: Du-ba-bi Du Du Du-de Du.) Instruments such as rhythm sticks or egg shakers can be used if they are available.
  - The 5/4 pattern used in Mars is made up of a triplet, two quarter notes, two eighth notes, and one last quarter note. Teacher writes the notes on the board for the class to see.

  ![5/4 pattern](Image)

  - Additionally, the phrase “Fourth from the sun is pla-net Mars” fits nicely with the rhythm pattern because of its similar rhythm. Teachers write this phrase underneath the notes you have written for the class.
  - With a little quick practice to the recording, the teacher and class will be able to repeat this phrase aloud to the music as it plays. Have the class practice saying the phrase to the music until they demonstrate mastery of the rhythm.

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**Conducting Activity:**
  - This particular movement of *The Planets* is in 5/4 which requires several special considerations when deciding how to conduct it. 5/4 differs from triple or duple time in that it can be subdivided as 3+2 or 2+3. For this reason, 5/4 is considered an irregular or “asymmetrical” time signature. Let’s begin by practicing a 5/4 conducting pattern:
This beat pattern is divided into a section of 3 and a section of 2, since it begins with 3 beats to the left (from the perspective of the conductor) and then 2 beats to the right. Another way to divide the pattern is into a section of 2, then a section of 3:

Practice both of these patterns a couple of times until they feel comfortable.

Now it’s time to do a bit of score study to decide which of these patterns will fit best with Mars.
As a class, clap the ostinato on the bottom line of the score. Then, look at the part right above it. Decide where the stresses in the ostinato pattern should be.

Teacher guides students to determine if a 2+3 or 3+2 pattern makes the most sense.

Have students try conducting both along with a recording.

Then, as a class, decide which one works best and explain why to another student.

Holst uses a 3+2 grouping of the beat division.

Teacher shares information about Mars:
- Mars is the god of War. In Greek mythology, he is known as Ares.
- The planet probably got this name due to its red color;
- Mars is sometimes referred to as the "Red Planet."
- The name of the month March derives from Mars.
- Mars is the fourth planet from the Sun, and the seventh largest of the nine planets.
Listening Map Activity:

- Have students start in the lower left hand corner of the map at the launch pad.

- Additional activity: After listening to Mars, students may wish to draw one picture that represents one of the scenes described on the listening map.

- These could then be placed in sequence on a bulletin board.
**Listening Compare/Contrast Activity:** (this could be done in partners or individually)

- Describe how the movement Venus contrasts with Mars.
- Complete the Venn diagram included with this packet. (APPENDIX B)

![Venn Diagram]

Here are some suggestions for what students might include in their map.

**Mars**
- 5/4 - irregular meter - provides a feeling of discomfort which mirrors the chaos of global war
- 5/4 march-like ostinato played by different instruments further evokes this feeling of war
- loud brass and percussion accents
- tempo: allegro

**Venus**
- evokes the feeling of hope and peace
- the sound of the glockenspiel enhances a feeling of lightness
- the lightness of the woodwinds and upper strings is featured

- Teacher shares some information about Venus
  - Venus is the Roman goddess of love and beauty. She is known as Aphrodite in Greek mythology.
  - The planet is so named probably because it is the brightest of the planets known to the ancients.
  - Venus is the second planet from the Sun, and the sixth largest of all the nine planets.
• **Summarizing Strategies/Check for Understanding:**
  o Answer LEQ’s with students
  o Students should be able to demonstrate correct conducting patterns

• **Accommodation/Differentiation ideas and tips:**
  o If you are not yet comfortable with the 5/4 conducting pattern, take a step back and first review the 2/4, 3/4 and 4/4 beat patterns.
  o One way to look at the 5/4 pattern is as an extension of 4/4. Look for similarities between the 4/4 pattern and the 2+3 5/4 pattern.

• **Extension activities:** Once students are comfortable with the 5/4 time signature, you might try putting them in groups to read the rhythms found below. Once completed successfully with body percussion and voice, instruments may be added. This will help reinforce the meter, and also characteristics of Mars.
LESSON #3 – (3) Mercury, the Winged Messenger & (4) Jupiter, the Bringer of Jollity

- **Prior Knowledge and Skills:**
  - Students are familiar and comfortable with moving in the classroom in response to music.
  - Students know Italian dynamic terms.

- **Materials:**
  - Recordings of Mercury & Jupiter
  - Paper
  - Pencils
  - APPENDIX D & E

- **Vocabulary:**
  - Predict
  - Dynamics

- **Essential Question(s):**
  - How can we describe music?
  - How can we move to show what is happening in the music?
  - What techniques do composers use to express certain feelings/moods in music?
  - How do changes in dynamics affect the mood of the music?

- **Activating Strategy:**
  - Prediction

- **Procedure/Teaching Strategies:**
  - **PREDICTION**
    - Using the title and what you already know about Mercury, PREDICT how you think this music will sound before you listen. Use the chart in APPENDIX D to write down your prediction and what really happened.
    - Your mission is to listen to this music inspired by Mercury and to fill up the sun with as many words as come to mind from the music. Write your descriptive words while you listen. Use as many as you can to describe music terms.
Teacher shares some information about Mercury. (This can occur before or after listening.)

- Mercury is the smallest planet in the solar system and the planet closest to the sun.
- Mercury does not spin on its axis as the Earth does. Therefore one side of Mercury is always facing the sun. The temperature on the lighted side gets very, very hot indeed!
- It is named after the Roman god who was the swift-footed messenger.
- This planet takes only 88 earth days to travel around the sun. So the year on Mercury is very short by our standards, and it passes swiftly.

Movement Activity:

- As you listen to the music, imagine if you landed on the hot surface of Mercury, got out of your space craft, and stepped on the surface. How would it feel? Watch yourself move around on that very hot surface. Let the music help you envision how your movements would look. Do your movements match the quality of the music? Choose a movement that you saw in your imagination while listening.
- Pick a partner with whom you can work productively. Perform your original movement for your partner. Then watch as your partner performs his/her original movement for you.
- Discuss how your movement shows the qualities of the music as well as the hot temperature. Learn each other’s movements and practice them until you can perform as a duet to the music.
- Then make up a new Mercury movement with your partner and practice until you both can perform it with confidence.

Teacher shares some information about Jupiter.

- Jupiter, the Bringer of Jollity - Jupiter, the fifth planet from the sun, is the largest in the solar system.
- It is named after a Roman god who ruled over all of the other Roman gods.
- Jupiter contains a famous British hymn tune called “I Vow to Thee My Country.” This chorale was played to commemorate the death of Princess Diana in 1997.
DYNAMICS CHART:
- Listen to excerpts demonstrating dynamic contrasts. Jupiter has dynamic changes early in the piece.
- Lead the class in a discussion around techniques used by composers to express feelings or a mood. Responses should include use of dynamics, different instruments and how they are played.
- Review list of dynamics. (APPENDIX E)
- Listen again to excerpts and have them list the dynamic level changes as the piece is played. This may take several listens. Share their “dynamic charts” with the class.

Writing Activity:
- Listen to a recording of Jupiter.
- On a piece of paper have students write down as many adjectives as they can think of to describe this piece.
- Have students pick 3 adjectives that they believe describes the piece the best.
- Students listen to the piece a second time and write why they believe those adjectives describe the piece using musical terms (e.g. joyful = the melody line ascends in a bright and accented way).

Summarizing Strategies/Check for Understanding:
- Students accurately completed Sun prediction chart.
- Students accurately completed Dynamics chart.
- Students accurately complete the Jupiter writing activity.
LESSON #4 – (5) Saturn, the Bringer of Old Age, (6) Uranus, the Magician, & (7) Neptune, the Mystic

Materials:
- APPENDIX F
- Calculator (for optional math activity)

Vocabulary:
- Compare and Contrast
- Tempo

Essential Question(s):
- How do changes in tempo affect the mood of the music?
- What techniques do composers use to express certain feelings/moods in music?
- Why do composers use specific tempo markings in their music?
- Why do composers choose to use certain instruments in their compositions?

Activating Strategy:
- Hand-clapping game
  - Students of every age enjoy hand clapping games.
  - Students can feel successful because there are varying levels of hand clapping, from the simple: clap, pat (with a partner), clap, pat, clap, etc. to the more challenging: shoulders (arms crossed), knees, clap, right, clap, left, clap, together, shoulders, knees, clap, etc.
  - Choose a song that students know and can sing. I recommend “Miss Mary Mack” (Most students know this song.)
  - Have students work in partners to keep the beat at varying tempos while singing and hand clapping.
• A recording of “Miss Mary Mack” with changing tempos can be found in Silver-Burdett’s *Making Music – Grade 2* book. It is a simple song, but again, everyone knows it so it works.

- **Procedure/Teaching Strategies:**
  - Tempo review - Write your chosen terms and their meanings on the board (or use the notebook file for the Smart board), or give the students a handout with the terms, and go over them with the students.

<table>
<thead>
<tr>
<th>Italian Term</th>
<th>English</th>
</tr>
</thead>
<tbody>
<tr>
<td>Largo, Lento</td>
<td>Very Slow</td>
</tr>
<tr>
<td>Adagio</td>
<td>Slow</td>
</tr>
<tr>
<td>Moderato</td>
<td>Moderately</td>
</tr>
<tr>
<td>Andante</td>
<td>Walking Tempo</td>
</tr>
<tr>
<td>Allegro</td>
<td>Fast</td>
</tr>
<tr>
<td>Presto</td>
<td>Very Fast</td>
</tr>
</tbody>
</table>

• After a brief review, Teacher distributes handout or uses the Smart board to slide to complete the form as information about the planets is shared and students listen to song examples. (APPENDIX H)

  - Teacher shares information about Saturn:
    - In Roman mythology, Saturn is the god of agriculture.
    - He is known as Cronus in Greek mythology.
    - Cronus was the father of Zeus (Jupiter).
    - Saturn is the root of the English word Saturday.

  - Listening: Saturn
    - Tempo: adagio

  - Teacher shares information about Uranus
    - Uranus is the ancient Greek god of the Heavens - the earliest supreme god.
    - He was the father of Cronus (also known as Saturn in Roman mythology) and of the Cyclopes and Titans (predecessors of the Olympian gods).
- Uranus is the seventh planet from the Sun and the third largest of the nine planets (in size). Uranus is larger in size but smaller in weight than Neptune.

- Listening: Uranus
  - Tempo: allegro

- Teacher shares information about Neptune:
  - In Roman mythology Neptune was the god of the Sea.
  - He is known as Poseidon in Greek mythology.
  - The planet was probably named after the sea gods because of its deep blue color.
  - Neptune is the eighth planet from the Sun and the fourth largest (by size) of the nine planets.
  - Neptune is smaller in size but it is heavier than Uranus.

- Listening: Neptune
  - Tempo: andante

- OPTIONAL – Math Activity - Your Weight in Other Worlds:
  - Students will use the worksheet found in APPENDIX F to determine their weight on other planets using a Mathematical formula
  - If a smart board and internet access are available, this same activity can be done as a class by going to this website: http://www.exploratorium.edu/ronh/weight/index.html

- Summarizing Strategies/Check for Understanding:
  - Students worked in pairs to show changes in tempo.
  - Students completed worksheet.
**FINAL ASSESSMENT:**
- A Sample Summative Assessment can be found in APPENDIX G.

Here are some additional possibilities for a final assessment.

✓ Give students an opportunity to listen to an excerpt from each of the movements. Ask students to write a few words to describe each movement.
  - **Answers might include:**
    - Mars – 5/4 time, loud and heavy, lots of brass, strings hit with wood of bow.
    - Venus – quiet and serene
    - Mercury – jumpy
    - Jupiter – ¾ time, happy, solemn, regal
    - Saturn – March, clashing bells
    - Uranus – loud, brass chords
    - Neptune – quiet, mysterious, singers

✓ Writing Prompt:
  - **If Holst had composed a movement for Earth, what would it sound like?**
    - Create a melodic line that describes Earth.
    - Provide a description as to why you wrote what you did and how your melody symbolizes Earth.
    - What kinds of instruments would you use? Tempo? Dynamics? Meter?
APPENDIX A – Sample Questions

Name: ________________________________

Date: __________________

1. What instruments did Holst learn as a boy?
2. When did Holst first start to compose?
3. How many sections or movements is The Planets?
4. What instrument did Holst first write The Planets for?
5. How many years did it take for Holst to compose the complete work?
6. What planet is not included in this work?
7. Is The Planets about outer space?
8. How far away is the sun?
9. What is the hottest planet?
10. What is the coldest planet in our solar system?
11. Which planet has the most volcanoes?
12. How many stars are in our solar system?
13. What were the names of the first two people to walk on the moon?
14. What does a Mars rover do?
15. What is Jupiter's “Great Red Spot?”
16. Name all of the planets that have rings.
17. Name all four “Gas Giants.”
18. Why isn't Pluto considered a planet anymore?
19. Name all five dwarf planets in our solar system.
20. How long does it take light to travel from the sun to Earth?
### Scavenger Fact Card # 1:
As a boy he learned to play the piano and the violin.

### Scavenger Fact Card # 2:
At the age of 12.

### Scavenger Fact Card # 3:
Seven sections

### Scavenger Fact Card # 4:
Holst wrote the music to be played by two musicians playing the piano.

### Scavenger Fact Card # 5:
Two

### Scavenger Fact Card # 6:
Earth
<table>
<thead>
<tr>
<th>Scavenger Fact Card # 7:</th>
<th>Scavenger Fact Card # 8</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Holst's <em>The Planets</em> is not really about the actual planets. It is a set of pieces that describe a certain moods. Holst used astrology's ideas about how the planets influence on our lives to provide the mood for each movement.</strong></td>
<td><strong>The sun is 93-million miles away from Earth. This is equal to 146-million kilometers.</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scavenger Fact Card # 9:</th>
<th>Scavenger Fact Card # 10:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mercury is the closest planet to the sun, but it is not the hottest. Venus is the hottest planet because it has many clouds that trap in heat.</strong></td>
<td><strong>Uranus is the coldest planet in our solar system.</strong></td>
</tr>
<tr>
<td>Scavenger Fact Card # 11:</td>
<td>Scavenger Fact Card # 12:</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------------------</td>
</tr>
<tr>
<td><strong>Venus has more volcanoes than any other planet.</strong></td>
<td><strong>There is only one star in our solar system - the sun. Our galaxy has millions of stars.</strong></td>
</tr>
<tr>
<td><img src="image1.png" alt="Venus Volcanoes" /></td>
<td><img src="image2.png" alt="Sun" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Scavenger Fact Card # 13:</th>
<th>Scavenger Fact Card # 14:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Neil Armstrong and Buzz Aldrin were the first people to walk on the moon.</strong></td>
<td><strong>Scientists have sent robots, called rovers, to explore Mars. The rovers drive around the surface of Mars, take pictures, and send them back to Earth.</strong></td>
</tr>
<tr>
<td><img src="image3.png" alt="Moon Landing" /></td>
<td><img src="image4.png" alt="Mars Rover" /></td>
</tr>
<tr>
<td>Scavenger Fact Card # 15:</td>
<td>Scavenger Fact Card # 16:</td>
</tr>
<tr>
<td>--------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>Jupiter, the largest planet, has a “Great Red Spot.” The red spot is a huge wind storm.</td>
<td>Saturn is famous for its bright rings, but it isn't the only planet with rings. Jupiter, Uranus, and Neptune also have them.</td>
</tr>
<tr>
<td>Scavenger Fact Card # 17:</td>
<td>Scavenger Fact Card # 18:</td>
</tr>
<tr>
<td>Jupiter, Saturn, Uranus, and Neptune are known as “Gas Giants” because they're made of mostly gas.</td>
<td>Pluto used to be considered a planet. Scientists decided it was too small to be a “real planet,” so it is now a dwarf planet.</td>
</tr>
<tr>
<td>Scavenger Fact Card # 19:</td>
<td>Scavenger Fact Card # 20:</td>
</tr>
<tr>
<td>There are five known dwarf planets in our solar system. Their names are Pluto, Ceres, Haumea, Makemake, and Eris.</td>
<td>It takes light eight minutes to travel from the sun to Earth. The sunlight you see outside right now, actually left the sun's surface eight minutes ago.</td>
</tr>
</tbody>
</table>
Venn Diagram

[Mars] [Both] [Venus]
APPENDIX D

PREDICTION

What really happened?
APPENDIX E

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Italian Term</th>
<th>English Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>pp</td>
<td>Pianissimo</td>
<td>Very Soft</td>
</tr>
<tr>
<td>p</td>
<td>Piano</td>
<td>Soft</td>
</tr>
<tr>
<td>mp</td>
<td>Mezzo Piano</td>
<td>Medium Soft</td>
</tr>
<tr>
<td>mf</td>
<td>Mezzo Forte</td>
<td>Medium Loud</td>
</tr>
<tr>
<td>f</td>
<td>Forte</td>
<td>Loud</td>
</tr>
<tr>
<td>ff</td>
<td>Fortissimo</td>
<td>Very Loud</td>
</tr>
<tr>
<td>&lt;cresc.</td>
<td>Crescendo</td>
<td>Gradually becoming louder</td>
</tr>
<tr>
<td>&gt;decresc.</td>
<td>Decrescendo</td>
<td>Gradually becoming softer</td>
</tr>
</tbody>
</table>
APPENDIX F

Name: _____________________________________

Date: _______________________

Use this chart to compare Earth’s gravity and years with that of the other planets. The figures for gravity change because of the differences in the size of each planet. The figures for years change because of the difference in each planet’s orbit around the sun.

<table>
<thead>
<tr>
<th></th>
<th>Gravity time earth</th>
<th>Earth years per planet years</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>0.38</td>
<td>0.20</td>
</tr>
<tr>
<td>Venus</td>
<td>0.91</td>
<td>0.62</td>
</tr>
<tr>
<td>Earth</td>
<td>1</td>
<td>1.00</td>
</tr>
<tr>
<td>Mars</td>
<td>0.38</td>
<td>1.88</td>
</tr>
<tr>
<td>Jupiter</td>
<td>2.54</td>
<td>11.86</td>
</tr>
<tr>
<td>Saturn</td>
<td>1.08</td>
<td>29.46</td>
</tr>
<tr>
<td>Uranus</td>
<td>0.91</td>
<td>84.01</td>
</tr>
<tr>
<td>Neptune</td>
<td>1.19</td>
<td>164.79</td>
</tr>
<tr>
<td>Pluto</td>
<td>0.05</td>
<td>247.69</td>
</tr>
</tbody>
</table>

Use the chart to calculate your weight and age on the planet of your choice. Do the work with a calculator.

To compute your age, use this formula:

\[
\frac{\text{(your age in Earth years)}}{\text{(planet years)}} = \text{(your age on the planet of your choice)}
\]

To compute your weight, use this formula:

\[
\text{(your weight on Earth)} \times \text{(planet gravity)} = \text{(your weight on planet)}
\]

Finish this sentence:

If I lived on the planet __________________________, I would be _________ years old and weigh _________ pounds.
APPENDIX G

Name: _____________________________________

Date: _______________________

FINAL SUMMATIVE ASSESSMENT

1. Please circle one: True or False

   *The Planets* are based on what astrologers thought about the planets and the Roman God associated with each planet.

2. How many years did it take for Holst to complete *The Planets*?
   
a. 2  
   b. 3  
   c. 5  
   d. 7

3. How many movements are there in *The Planets*?
   
a. 2  
   b. 5  
   c. 7  
   d. 9

4. All planets are represented EXCEPT: ________________________________

5. Mars is based on:
   
a. peace  
   b. wealth  
   c. war  
   d. marching

6. Venus is based on:
   
a. peace  
   b. wealth  
   c. war  
   d. marching

7. In the movement Mars, what grouping of the beat division does Holst use?
   
a. 2+4  
   b. 2+3  
   c. 3+2  
   d. 5+1
8. How many instrument families are there in the orchestra?
   a. 3    b. 4    c. 5    d. 6

9. Please circle one: True or False
   Saturn, Uranus, and Neptune all have similar tempo markings.

10. Short Answer: What techniques do composers use to express certain feelings/moods in music?

    __________________________________________________________

    __________________________________________________________

    __________________________________________________________
APPENDIX H

Name: _____________________________________

Date: _______________________

<table>
<thead>
<tr>
<th>PLANET</th>
<th>TEMPO</th>
<th>MOOD</th>
<th>INSTRUMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saturn</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Uranus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neptune</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Instrument Guide:**

**String Family**

The string section is the largest in the orchestra. For a classical concert, the Delaware Symphony Orchestra typically uses 26 violins, 10 violas, 10 celli, and 8 double basses.

In appearance, they are shaped roughly the same. They are made of wood, and the bow is strung with horse’s hair. The size and length of strings determines the pitch of the note. For instance, the longer strings play lower notes. The double bass, the largest bowed instrument, stands approximately six feet tall, while the violin, the smallest, is about eighteen inches long. The cello and double bass rest on the floor, while the violin and viola are supported under the musician’s chin. The sound is made by pulling a bow across the strings or plucking the strings with your fingers (called *pizzicato*).

![String Instruments Diagram]

Other orchestra instruments with strings but no bows are the harp and the piano. The harp is played by strumming or plucking the strings. The piano makes a sound when a key pushed with your fingers forces a small hammer against the strings.
Instrument Guide:

Brass Family

The brass section adds a “punch” to the orchestra. When it’s time for the music to get loud, the brass section will usually kick in. The Delaware Symphony uses four French horns, two or three trumpets, two tenor trombones, one bass trombone, and one tuba.

Brass instruments get their name because they are made of metal, usually brass. To make sound, musicians make a buzzing sound into the mouthpiece. As with all instruments, the shorter ones play higher notes, and the longer ones play lower notes. Brass instruments started out in a straight shape, but because the long ones were difficult to carry, people started winding the tubing.

The Trumpet makes the highest sound and is the smallest in this family. It was once used to frighten enemies in battle! Early versions go back 3500 years; one has even been found in King Tut’s tomb!

The Trombone was invented in the 1300’s and originally called a sackbut. The trombone is the only brass instrument that has a sliding part. There are seven different positions that a player uses to get distinctive notes. Don’t slide it too far, or the tube will fall off the end of the instrument!

The French horn was invented in the 1600’s and used as hunting horns or methods of communication. Different signals had different meanings (e.g. “come here” or “let’s go home”). The French horn is the only valved instrument that is played left handed. The right hand is placed in the bell while playing to help make the sounds mellow and keep the notes in tune.

The Tuba is the biggest, heaviest, and lowest sounding instrument in the brass section. It was designed in 1835, which makes it one of the youngest instruments! The marching tuba is called the sousaphone, which was invented by and named after John Philip Sousa, who is sometimes called “The March King.”
Instrument Guide:

Woodwind Family

Woodwinds play a key role in any orchestra. They are melodic and play delicately. They can play both high and low notes as well as make special sounds, such as the tweeting of a bird. The Delaware Symphony Orchestra typically uses two clarinets, two oboes, an English horn, two flutes, a piccolo, and two bassoons.

This family's name was chosen because most of the instruments are made of wood, and it takes wind to play them. The tone is produced by air blown directly into a hollow tube or by vibrations caused by reeds, which are made from pieces of bamboo. All woodwind instruments have systems of keys that can be opened and closed by a musician's fingers.

![Flute, Clarinet, Oboe, Bassoon](image)

The Flute is one of the oldest instruments and used to be made of wood. Today, it is usually made of silver, gold, or platinum. The Piccolo or Flauto (little flute) is also used in the orchestra and has a sharp tone.

The Clarinet is made of hard woods, like ebony or grenadillo. The sound occurs when air vibrates across the single reed attached to the mouthpiece.

The Oboe is a double reed instrument that gives the orchestra the tuning note (an “A”) because it is easiest to hear. It has a big brother called the English Horn, which is longer and lower sounding than the oboe.

The Bassoon is the largest and lowest sounding in this family. A curved metal tube called a crook helps bring the double reed to the player's mouth.
Instrument Guide:

Percussion Family

The percussion section in the orchestra has almost every kind of sound-making device there is. There are two kinds of percussion instruments: tuned and undefined. Tuned instruments can play a distinct note while undefined instruments make the same sound.

An additional percussionist plays only the timpani. There are three or four timpani used depending on the music. On the bottom are foot pedals that, when pushed, can play a different pitch. Timpani are sometimes called kettle drums because they look like big copper kettles.

Examples of Tuned Instruments:

Examples Undefined Instruments:
**SOURCES**

http://isisweb.8m.com/holst/planets.htm

- Excellent website! It has a chart for each movement, which includes the tempo, orchestral highlights, notes about the piece, and where you may have heard it before.

http://edhd.bgsu.edu/~sbanist/611/final/melinda/Planetsunit.pdf

- This website tells the year written, order composed, tempo, orchestral highlights, notes about the piece, and where you may have heard it.

http://files.tso.ca/PDF/Youth/1011_Intermediate_Senior_Study_Guide.pdf

- This website includes “Blast Off,” the Toronto Symphony’s Intermediate/Senior Level Student Concert Guide to Holst’s *The Planets* and other orchestral works.


- Provides a nice outline of the planets with a few short facts about each


- Provides some theory analysis of Mars

http://www.freeimages.co.uk/galleries/space/planets/index.htm

- Images of space and planets

http://www.exploratorium.edu/ronh/weight/index.html

- Determine your weight on other planets through an interactive website.

http://www.nasa.gov/audience/forkids/kidsclub/flash/index.html

- NASA Kids Club