The Reasons for the Seasons

 Does the entire Earth experience the same

season at the same time?

 1.1.2, 1.2.2, 1.2.3, 1.2.4, 1.2.7, 1.3.1, 1.4.1,

1.4.2, 1.4.8, 1.5.1, 1.5.4, 1.5.9, 2.2.2.1

SWBAT describe the 3 reasons why Earth has seasons.

SWBAT justify their reasoning why Earth has seasons.

SWBAT understand why the seasons for each hemisphere are reversed.

 Articles for engagement, Power points, lab packets, ring stands, graph paper, flashlights, calculator, protractor, tape, globe, sticky notes, orbital position cards, N. Star, computers, chart paper, markers

 6 different articles (Internal Clock of Mums, Stonehenge, Circles of the Seasons, Chaco’s Lost Sun Dagger, Why Leaves Change Color, Hummingbird Migration) – different articles for each group, discuss, develop a question from article, write on chart paper

Direct/Indirect Activity: (Foundational (F) and Intermediate (I) Groups)

* prediction, hypothesis, constructing apparatus, conducting activity,

 recording data, calculating light energy/square

“Sun” – Earth Model Activity: (F and I groups only)

* prediction, hypothesis, constructing model, conducting activity, recording data

Seasonal Effects and Earth’s Axis Wobbles: (Advanced (A) Group only)

* use computers to answer questions from lab sheet

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| **Lesson Title:** | Teaching Strategies* Accountable Talk®
* Audio
* Classification
* Concept Attainment
* Cooperative Learning

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* Data Analysis
* Graphing & Interpretation
* Grouping Strategies
* Independent Reading
* Independent/Group project
* Integration of Math
* Integration of Technology
* Integration of Writing
* Interdisciplinary Connections
* Interpretation of Graphics
* Interpretation of Primary Sources
* Laboratory
* Math Skills
* Modeling/Demonstration
* Pair Check/Review
* Presentation of Work Product
* Reading (before, during, after)
* Role Play
* Roundtable
* Scaffolded Questioning
* Science Skills
* Simulation/Act-It-Out
* Small/large Group
* Small/large Group Discussion
* Technology Skills
* Think-Pair-Share
* Use of STEM tools
* Video Clips
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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| **Higher – Order Question(s):** |
| **Curriculum Connection:****Objective(s):** |
| **Materials:** |
| **Engagement:** |
| **Exploration:** | Differentiation Strategies* Curriculum Compacting
* Flexible Grouping
* Independent Projects
* Learning Centers
* Tiered Assignments
* Varying Questions
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

*Learning Modalities** Auditory
* Tactile/Kinesthetic
* Visual

*Modifications** Adapt Materials
* Adapt the Number of Times
* Adapting the Skill Level
* Increase Personal Assistance
* Provide Audio/Video/Digital Access
* Provide Learning Strategy

 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Integration of Technology*** Computer Programming
* Computer Research
* Create Product using Technology

(pwrpt, wd. processing, spreadsheets, etc.)* Manipulate Data using Technology
* Technology Communication
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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| **Explanation:** Direct/Indirect Light Activity:  (F & I groups) - analysis questions and conclusion questions, prove  or disprove hypothesis (A group) – description of the effect of direct/indirect sunlight on  seasons“Sun” – Earth Model Activity: (F & I groups) – analysis and conclusion questions, draw & label a  model of position of earth around sun during each equinox and  solstice (A group) – draw & label a model of position of Earth around sun  during each equinox and solsticeSeasonal Effects and Earth’s Axis Wobbles: (F & I groups) – none (A group) – use computers to answer questionsDirect/Indirect Light Activity: (F & I groups) – conclusion question #2 (A group) – none“Sun”- Earth Model Activity: (F & I groups) – conclusion questions  #1 and #2 (A group) – noneSeasonal Effects and Earth’s Axis Wobbles: (F & I groups) – observe  questions/answers from advanced group during gallery walk (A  group) – answer questions from both sections in activityThe Reasons for the Seasons Analysis: Answer questions by group  only (see power point) - (F & I groups) – answer questions #1 – 12  (2 questions only/group), write Q & A on chart paper for gallery  walk (A group) – use computers to answer questions # 13 – 21 (3  questions only/group)Gallery Walk: (F, I, and A groups) – students will observe the  questions answered by other groups and record the answers on their  activity sheet Pre-Assessment: During PLC, answer question “Why does earth have seasons?” (use to establish groups)Formative: analysis questions, check-ins throughout lesson, circulate around room listening to group conversations & clarifying questionsSummative: last question in Reasons for Seasons Analysis as Exit Slip None | Reading Strategies***Text:*** Literary Informational *Before:** Predict Purpose
* Preview Vocabulary Concepts
* Prior Knowledge

***During:**** Chunking Cloze
* Concept Map Reread
* Metacognitive Conversations
* Self-monitoring through clarifying questions and notations on text
* Stop – Jot Text-Rendering
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

***After:**** Summarize or paraphrase
* Use Rubrics
* Write BCRs to reading questions

***General Reading Process:**** Comprehension Decoding
* Fluency Vocabulary
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Writing Strategies*** Brainstorming Chunking
* Drafting Editing
* Formal or Informal Writing
* Graphic Organizer Journaling
* Key Concepts/Skills are Embedded
* Modeling/Demonstration
* Peer Review Timed Writing
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Review Strategies*** Bingo
* Crossword Puzzle
* Four Corners
* Graphic Organizer
* I Have/Who Has…
* Inside/Outside Circles
* Game: Jeopardy, Password, etc.
* Popcorn Q & A
* Snowball Toss
* Thumbs Up/Thumbs Down
* White Boards
* Other\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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| **Extension:** |
| **Evaluation:****Homework:****Reflection:** | **Assessment*** Check for Completion
* Checklist
* Collect & Grade
* Constructed Response
* Exit Slip
* Formative Assessment
* In-Class Check
* Informal Assessment
* Journal/Learning Log
* Peer/Self Assessment
* Performance Assessment
* Portfolio
* Presentation
* Probe
* Quiz
* Rubric
* Test
* Thumbs Up/Thumbs Down
* Other \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
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| Course Curriculum Connection* \_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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* Hypothesis (1.2.1 – 1.2.3)
* Data Collection (1.2.4)
* Data Analysis (1.4.2 – 1.4.7, 1.6.5)
* Draw Conclusions (1.1.3 – 1.1.5, 1.5.1, 1.5.8)
* Presentation (1.4.1, 1.5.2, 1.5.9)
* Skills Practice (1.7.1)
* Lab Equip. (1.3.1 – 1.3.4)
* Use Technology (1.4.8, 1.5.3, 1.5.5, 1.6.2)
* Graphing Activity ((1.5.4)
* Use Math (1.6.1, 1.6.3, 1.6.4, 1.7.4)
* Field Trip/Guest Speaker (1.7.7)
* Classifying (1.5.7)
* Role of Science (1.7.1 – 1.7.3, 1.7.5, 1.7.6)

 **Literacy Standards – Writing****Text Types and Purposes*** 1. Write arguments focused on content
* 2. Write informative/explanatory texts

**Production & Distribution of Writing*** 4. Produce clear and coherent writing
* 5. Develop and strengthen writing
* 6. Use technology to produce and publish writing

**Research to Build and Present Knowledge*** 7. Conduct short research projects to answer a question
* 8. Gather relevant information from multiple print and digital sources
* 9. Draw evidence from informational texts to support analysis, reflection and research

**Range of Writing*** 10. Write routinely over extended and shorter time frames.

Standards for Mathematics Practices* 1 Make sense of problems & nse of problpersevere in solving them
* 2 Reason abstractly & quantitatively
* 3 Construct viable arguments & critique reasoning of others
* 4 Model with mathematics
* 5 Use appropriate tools strategically
* 6 Attend to precision
* 7 Look for & make use of structure
* 8 Look for & express regularity in repeated reasoning
 | Literacy Standards - Reading**Key Ideas & Details*** 1. Read closely; cite specific textual evidence …
* 2. Determine central ideas of a text & analyze their development; summarize the key supporting details and ideas
* 3. Analyze how and why ideas develop & interact over the course of a text

**Craft and Structure*** 4. Interpret words & phrases as they are used in text…
* 5. Analyze the structure of texts …
* 6. Assess how point of view or purpose shapes the content and style of a text.

**Integration of Knowledge and Ideas*** 7. Integrate and evaluate content presented in diverse media and formats …
* 8. Delineate and evaluate the argument and specific claims in a text …
* 9. Analyze how two or more texts address similar themes or topics …

**Range of Reading & Level of Text Complexity*** 10. Read and comprehend science /technical texts at grade level independently and proficiently

 **Standards for Technological Literacy****Develop an understanding of the:** * 1: characteristics & scope oftechnology
* 2: core concepts of technology
* 3: relationships among technologies and the connections between technology & other fields of study.
* 4: cultural, social, economic, &political effects of technology.
* 5: effects of technology on the environment
* 6: role of society in the development and use of technology.
* 7: influence of technology on history
* 8: attributes of design.
* 9: engineering design.
* 10: role of troubleshooting, research & development, invention & innovation, & experimentation in problem solving

**Develop abilities to:*** 11: apply the design process.
* 12: use & maintain technological products & systems.
* 13: assess the impact of products & systems.

**Develop an understanding of & be able to select & use:** * 14: medical technologies.
* 15: agricultural & related biotechnologies.
* 16: energy & power technologies.
* 17: information & communication technologies.
* 18: transportation technologies.
* 19: manufacturing technologies.
* 20: construction technologies.
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