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**Planning the inquiry**

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| **1. What is our purpose?**  **To inquire into the following:**   * **Transdisciplinary theme: How the World Works** * **Central idea : Changes in the world may drive people to adapt.** * **summative assessment task(s):**   By the conclusion of this unit, students should be able to demonstrate the following competencies: Understanding of materials that are good insulators  Goal: Four students in each group will design an energy efficient home for a certain region of Georgia.  Role: Students will be engineers deciding how to use colors and insulation to create energy efficient homes for each region of Georgia.  Audience: Other students and parents, homeowners/buyers looking to settle in those regions  Scenario: (to student) Your team is to design a home for a certain region of Georgia. You are to use different types of insulation and different colored materials to create the most energy efficient home for that region. In the “Most Energy Efficient Home” contest, when homes are exposed to high and low temperatures, the home that experiences the least temperature change will be declared Georgia’s Most Energy Efficient Home  Students will focus on using and developing research skills.  Students will be given a specific region/ may give students choice from a list of regions.  Performance Assessment (DGDB Unit Test: Test ID 2231121)  Regions of GA  And what the energy needs are  We can use the word regions | Class/grade: 3rd grade Age group: 8-9  School: Copeland Elementary School code:  Teacher(s): Gist, Denson, Brace, David, Garcia  Date: Jan 11- Feb 26  Proposed duration: 70 hours, 6 weeks  **2. What do we want to learn?**  What are the key concepts (form, function, causation, change, connection, perspective, responsibility, reflection) to be emphasized within this inquiry?  **S3P1b**   * I can use thermometers to measure the effect of sunlight on various objects.   **S3P1c**   * I can design and construct a device increase and/or decrease the warming effect of sunlight.   **Key Concepts**: Change- How is it changing?  Form – What is it like?  Function- How does it work? Key Vocabulary burning • friction • heat energy • heat source • insulation (insulator) • temperature • thermometer • transfer of heat energy  **Science Text Book Lessons Focus:**  **S3P1b-** SE Unit 5 (Lesson 3) pp.183-192  **S3P1c-** SE Unit 5 (Lesson 4) pp.193-194  **Related Concepts:** Properties, systems, adaptation  What lines of inquiry will define the scope of the inquiry into the central idea? ( **change into phrases)**   * There are many sources of heat energy * Sources of forms of energy (solar, nuclear, electric.....) * Various Sources of heat of natural energy can be transferred, measured and used. * How energy is transferred, measured and used * Social Students (GA) line of inquiry * An inquiry into how a region affects energy use * How energy is used based on geographic location – regions/natural resources so students will know the energy they will use * (energy source – ga/US compared to other countries)   What teacher questions/provocations will drive these inquiries?  Heat   * What’s the difference between heat and temperature? * How is heat transferred? Line of inquiry 1.22.2021 * How is heat energy produced? * Why is temperature important in our lives? * Why do scientists use thermometers? * Why do some materials conduct heat better than others? * What does it mean to be energy efficient? * Why is using insulation important when heating and cooling? * How do various materials affect the transfer of heat energy from the sun? |
| **3. How might we know what we have learned?**  *This column should be used in conjunction with “How best might we learn?”*  What are the possible ways of assessing students’ prior knowledge and skills? What evidence will we look for?   * KWL * Note taking * Pre-Assessments * Accessing prior knowledge * Post Assessment * Visual Learning   Through teacher/student discourse using the unit vocabulary as well as the key concepts. Teacher will assess students on their ability to use vocabulary words correctly. | **4. How best might we learn?**  What are the learning experiences suggested by the teacher and/or students to encourage the students to engage with the inquiries and address the driving questions    **Tuning In Week One**  **The goal for students to obtain, evaluate, and communicate information about the ways heat energy is transferred and measured.**  Students will be shown a collage of pictures of heat sources and write down two or three questions of what they think about heat  Students will do a Graffiti board identify sources of heat energy. Students are free to write or draw any ideas that are sparked by the words displayed.  Students will watch Heat Energy video on <https://www.youtube.com/watch/xGKg3TSO4v8>   |  | | --- | |  |   **Finding Out Week Two**  Students will watch BrainPOP Jr video <https://jr.brainpop.com/science/energy/heat/>.  Students will use their Science textbook to locate photographs, drawings, and other visual images of heat energy. Students will then work in groups to list as many sources of heat energy in 10 mins.  Students will then utilize in class technology to research heat energy comparing then to the now. They will learn about Lewis Howard Lattimore the African American inventor of the incandescent light bulb and other African American inventors that contributed to ( gas burner, lantern, heating furnace)  This will allow the students to form opinions as to why and how the sources of heat energy have changed over the year   |  | | --- | |  |   **Sorting Out Week Three:**  Students will sort heat and cool insulators. They will also be able to answer Why do some materials conduct heat better than others?  Students will complete the Chocolate Kiss Heat Experiment.  Students will place one chocolate kiss in each hand. One hand will be left open and the other closed. Students will predict and observe what will happen during this experiment.   |  | | --- | |  |   **Going Further Week Four**  Cooperative group task: The students will work together to discuss the original source of heat energy (Sun). Sun is the original source of heat energy. Heat energy is transferred in many different ways.  So Many Sources Lesson ( Discovering Science through Inquiry)  Students will write a short stor about waht daily life would be like if your only energy sources was the sun, water and wind. Describe and draw a picture of how the neighborhood would look like.     |  | | --- | | **Reading:** |   **Drawing Conclusions/** Reflecting and Acting **Week Five**  Students will create a Class Diary of their personal experiences and the students will be able to share what they’ve learned through this unit.  Why are the Temperatures Changing? Ice-Cold Lemonade experiment  Which idea do you thin best explains why the Lemonade was cold?  Students will be given a cup of lemonade and take the temperature. Ice will be added and students will wait 10 minutes to take the temperature again. Students will have made predictions about if, how and why the temperature changed.     |  | | --- | |  |   What opportunities will occur for transdisciplinary skills development and for the development of the attributes of the learner profile?   |  | | --- | | **Transdisciplinary Skills:**   * Communication skills – Students will present on the heat energy. Students will collaborate with peers in various activities and assignments each week of the unit. * Social Skills – Students will participate in collaborative group and partner discussions. * Self-Management Skills – Students will perform physical activity experiments with thermal energy each week. * Research Skills – Students will research the heat energy * Thinking Skills – Comprehension Students will work on reading passages asking and answering questions related to thermal energy. | |
| **5. What resources need to be gathered?**  **Materials**: Computer Technology , Internet Resources-YouTube, Brain Pop Jr. Inquiry Notebook, Comprehension Worksheets,  Lemonade activity ( thermometer, cups, lemonade, ice)  Chocolate Kiss Experiment Teacher Directions Materials : 2 chocolate kisses per student, baby wipes or sink to wash hands, kiss experiment response sheet—1/22/2021 guided inquiry planning  Science Textbook  PHET-science simulation website    Make it Change by David Evans (Dorling Kindersley)  Experiment with Heat by Salvatore Tocci (True Books)  It’s Much Too Hot! An Early Learner Book About Heat by Bob Graham  How will the classroom environment, local environment, and/or the community be used to facilitate the inquiry?  Additional Children’s Literature: Animal Extremes: Cold, Colder, Coldest – Animals That Adapt to Cold Weather by Michael Dahl ISBN:  1404810145 Little Polar Bear by Hans de Beer ISBN: 1-55858-358-0 Science Project Ideas About The Sun by Robert Gardner ISBN: 0-98490-845-6  Sun up, Sun down by Gail Gibbons ISBN: 0-329-13006-4 Elmer In The Snow by David McKee ISBN: 0-6-88-14596-5  Thomas’ Snowsuit by Robert Munsch ISBN: 0-920303-32-3 A New True Book Experiments with Heat by Walter Oleksy ISBN: 0-516-01277-0  Amazing Science: Sizzle! A Book About Heat Waves by Rick Thomas ISBN: 1404809279  Experiments With Heat (True Books: Science Experiments) by Salvatore Tocci ISBN: 0-516-22510-3  All About Heat (Rookie Read-About Science) by Lisa Trumbauer ISBN: 0-516-23608-3  Discovering Science through Inquiry: Energy Teacher Created Materials  MYON Books: Heat Written by Darlene SteeleStille, Darlene R. Stille, Darlene R. | |
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| **6. To what extent did we achieve our purpose?**  Assess the outcome of the inquiry by providing evidence of students’ understanding of the central idea. The reflections of all teachers involved in the planning and teaching of the inquiry should be included.  Denson- Students were able to grasp the central idea and incorporate it in multiple parts of the lesson and other disciplines as well. In my class it seemed that they were able to connect this them better than any other theme so far. For example when talking about Ruby Bridges how what she did drove changes, and within our point of view ELA lesson about two bad ants. The students completed a little notecard saying how what she did during her time, made things they were today. They also made notice of it when we did several read alouds to include the Magic School Bus and Chocolate Fever how the people had to adapt based on what was happening around them. One of the things I wished we could have done was dug deeper into the heat connection. However the students were able to identify various heat sources.  **Murdaugh-Gist-The students were able to make world connection of the central idea and apply it to their lessons throughout the unit duration. There were challenges of quarantine and other factors that arose causing delays in some of the activities. The activities of Ruby Bridges and also learning about heat energy were very effective for the students. Student were able to demonstrate in the classroom and also outside during recess and even a fire drill heat energy. During the fire drill students struck conversations about how they could generate heat while they stood in the frigid weather for the drill. Some made the connection and observation that their coats and jackets were insulated for heat energy.**  **David-The students did an overall great job being able to apply the central idea to different segments of the lesson. The students found it a bit more easier to apply since they were interested in the topic, and had previous knowledge about heat. The students were able to relate the read aloud and activities to past experiences and enjoyed sharing these ideas with the class.**  **Spanish/Garcia - Fire-heat-hot-cold, temperature, sun, transfer, wind, energy. They learnt that some English words were similar in English & Spanish.**  How you could improve on the assessment task(s) so that you would have a more accurate picture of each student’s understanding of the central idea.  Denson- The way that I can improve on the assessment task is to make sure that I stick to the schedule and complete the overall culminating project. Again with the unit alot was planned, but my class wasn’t able to get everything accomplished. We never got to the big culminating task, but were able to complete a few of the activities; such as the graffiti board, the chocolate kiss experiment, and heat sources. A few things contributed to this dilemma, Covid, non-planned school requirements, and the actual time it took students to complete the planned out activities that we were able to do in class. So even though we tried to do at least one activity a week, maybe dropping them down to three and remembering mandatory district testing, fire drills and all other school related interruptions.  **Murdaugh-Gist- I feel that in order to improve is to just stick to one detailed project and build upon the one project throughout the entire unit until the end. We put too many small activities in this unit that took away time and also with other events and activities being incorporated in the day to day learning made it very hard to accomplish all that was planned in this unit. The class was quarantined as a whole and then others chunks quarantined again so the pandemic caused challenges also.**  **David- I feel as if we needed more time to complete all of the activities and task in this unit. I would have liked if I had the chance to continue to build upon the provocation at the beginning of the unit. It’s a bit of a challenging for me virtually trying to balance all subjects within the short time I have. I also endure a lot of technical issues with caused a delay of certain activities.**  What was the evidence that connections were made between the central idea and the transdisciplinary theme?  Denson- The connections were made with this unit were stronger than any other unit. The students connected the smallest things such as the weather and how it it played apart if in we had recess outside or inside. The also tied it in with our Sanford Harmony lessons when looking at how people respond to communications. Finally whenever there were a change in plans we learned quickly that we had to adapt to what was happening around us.  **Murdaugh-Gist-Students were very aware in this unit. I do believe this was the most effective unit for many of my students in spite of the pandemic challenges. Students were very observant throughout the classroom and the school as well in relation to our central idea Changes in the world may drive people to adapt. They recognized that when we had to pivot to learn from home and also on the day of our read aloud with Mrs. Shoemaker the time and location changed and students connected being able to adapt to changes.**  **David-The connections were made in this unit quite well due to the fact that many students had prior knowledge or experiences about heat. The students were able to connect it to the central idea and learned how to adapt to changes in the world.**  **Spanish/Garcia - Spanish was connected to the central idea through the key concepts: heat, energy, fire, hot, cold, temperature, and sun.** | **7. To what extent did we include the elements of the PYP?**  What were the learning experiences that enabled students to:   * develop an understanding of the concepts identified in “What do we want to learn?”   Denson-The learning experience that kicked it off was the graffiti board activity when they realized so many things give heat. They wanted to get a better understanding of how. The other big hit was the chocolate Kiss experiment, it lead to a lot of questions that we didn’t even get to answer.  **Murdaugh-Gist- In my class the experience that initiated lots of conversation was creating heat energy Graffiti boards. The students were really reflecting and thinking about the many things they knew that generated heat. This was a daily conversation in which they enjoyed and wanted to do again in the next to unit.**  **David- The learning experience that sparked conversation in my class was the Ice-Cube versus Hershey kiss activity. The students had a heated debate about which item would melt the fastest in the heat or in their hand which generated heat. The students wanted to test out other objects around the house.**  **Spanish/Garcia - Students connected previous experiences with a video in Spanish about Heat & Energy. They named some sources of heat energy.**   * demonstrate the learning and application of particular transdisciplinary skills?   Denson-Students had to make sure were able to discuss (communicate) their predictions with each other on whether the chocolate kiss would melt and why. They worked in groups of four and stated how they figured the experiment would go. Additionally, when looking up leaders for their project they used their research skills and communication skills to create a quilt that would convey their thoughts in words and pictures.  **Murdaugh-Gist-The students were communicators and thinkers. With thier tables they engaged in open discussions about heat energy as they drew their examples and shared with one another. Many introduced many different experiences with thermal energy.**  **David-The students were inquirers, open-minded and communicators as they predicted which item would melt the fastest. The students were also reflective as they compared and made predictions about Heat sources, and what caused both to melt and one to melt faster in certain environments.**   * develop particular attributes of the learner profile and/or attitudes?   In each case, explain your selection.  Denson-Students really became risk takers , thinkers, open minded and reflective. They demonstrated being risk takers by being involved in the process and feeling comfortable enough to ask the questions they really wanted to know. Thinkers were demonstrated by using critical thinking skills to think out the process by using predictions with the chocolate kiss experiment. They were open minded when it came to changes in the schedule that didn’t allow us to complete some of the activities that were planned for the day. And finally the students were reflective in what ways their project actually came out after the chocolate kiss experiment.    **Murdaugh-Gist- In this unit the students demonstrated the following attributes.**  **Risk Takers- Many students were so excited to share being communicators about experiences with heat energy in their lives and what they notice at school. Many that shared normally are very shy and do not share out voluntarily. This drove others to share and drove them all into being thinkers: As the conversations continued the students thinking really activated driving the conversation to recognizing heat and weather comparisons in other countries they had visited on cruises and vacations. Each day the students were reflective as they were able to connect their learning as it related to the lessons**  **David- The students demonstrated multiple learning profile/attributes throughout the duration of the unit. Students were open-minded about heat sources and their classmates opinion even if it didn’t align with their initial thought. Students were risk takers as they were not afraid to test out different objects that would melt in the sun or with a blow dryer. Students were also great communicators as they were able to share ideas with the class and I about what they witnessed or believed would happen in certain scenarios. Students were also reflective as they reflected on pass experiences and on various activity findings.** |
| **8. What student-initiated inquiries arose from the learning?**  **What student-initiated actions arose from the learning?**  Denson- Students begin to look at how their behavior would impact those around them and how other students adapted to this behavior. They were even able to make connections to our read aloud. Students wondered how did heat get into our body, what makes the sun give heat.  **Murdaugh-Gist The students were able to connect being able to adapt to many aspects of their day to day learning. During the fire drill students struck conversations about how they could generate heat while they stood in the frigid weather for the drill. Some made the connection and observation that their coats and jackets were insulated for heat energy. In the cafeteria students were able to identify that the containers or wrappers their foods were packaged in were insulators to keep the food warm.**  **Spanish/Garcia- Students asked why some english words were very similar in Spanish such as: energy, temperature, and transfer** | **9. Teacher notes**  **Denson-The next time that we complete this unit I think we should make sure that we incorporate things that also support more of African American History. Additionally although our experiments were nice, maybe break of the culminating task into the weeks so that it is able to be completed. Finally just managing time and expectations for next year.**  **Murdaugh-Gist- The next time we execute this unit. I would like to make sure we are more aligned with our district pacing guide and curriculum map as close as we can to ensure we are still covering learning targets and making adequate progress to cover the priority standards outlined. I also too would like to focus more on African American studies if this unit falls within that time of year next year.**  **David-I agree with my Teammates I would like to incorporate more African American History activities within this unit. (If it falls during February next time)**  **Spanish:**  **K-5: Unfortunately, we didn’t have enough time to cover the unit of inquiry because many classes had to pivot to learn at home, included myself. So, we didn’t have the time to develop the unit ...and just few classes had the chance to connect Spanish with the Unit of Inquiry.**  **Nevertheless, the Spanish Youtube Channel that was created in collaboration with another Spanish PYP teacher and I helped a lot to connect Ss with the vocabulary, concepts and classes that we missed face to face.** |

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**Resources**