3rd Grade
Hot Fashions
Eco-Energy for Schools

Unit Overview	
Unit Title	Hot Fashions
Unit Summary	Sun's rays have an effect on objects of different colors – clothing that is dark colors and light colors. Different cultures wear different types of clothing depending on the time of the year and the sun's angle.
Subject Area Strands	Science – Energy Atmosphere, Weather and Climate Math – Measurement and Data Represent and Interpret Data Numbers and Operations in Base Ten ELA – Language Communication Writing Research Social Studies – Geography Groups and Interactions
Grade Level	3rd Grade
Appropriate Time	5 days

Lesson Foundation

Targeted Content Standards

Common Core Standards

Mathematics

- **3.NBT.A.2**
  Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of operations, and/or the relationship between addition and subtraction.
- **3.MD.B.4**
  Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
- **3.MD.B.3**
  Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories.

English / Language Arts

Reading Strands for Informational Text

- **RI.3.1**
  Ask and answer questions to demonstrate understanding of a text, referring explicitly to the text as the basis for answers.

Writing

- **W.3.6**
  With guidance and support from adults, use technology to produce and publish writing (using Keyboarding skills) as well as to interact and collaborate with others.
- **W.3.8**
  Recall information from experiences or gather information from print and digital sources; take brief notes on sources and sort

Speaking and Listening

- **SL.3.1d**
  Explain their own ideas and understanding in light of the discussion.

TN Standards

Science

- **SPI 0407.Inq.1**
  Select an investigation that could be used to answer a specific question
- **SPI 0307.T/E.2**
  Recognize the connection between a scientific advance and the development of a new tool or technology.
- **SPI 0307.10.1**
  Use an illustration to identify various sources of heat energy.
- **SPI 0307.10.2**
  Classify materials according to their ability to conduct heat.
  .

	Social Studies	• **3.3.spi.7** Determine the climate of a specific region of the world using a map. • **3.6.spi.2** Recognize major global concerns. • **3.1 spi. 1** Recognize some of the major components of a culture. • **3.1 spi. 2** Determine similarities and differences in the ways different cultural groups address basic human needs.
	Next Generation Science Standards	**<u>Science and Engineering Practices</u>** • **Asking Questions and Defining Problems** Asking questions and defining problems in grades 3–5 builds on grades K–2 experiences and progresses to specifying qualitative relationships. o Ask questions that can be investigated based on patterns such as cause and effect relationships. (3-PS2-3) o Define a simple problem that can be solved through the development of a new or improved object or tool. (3-PS2-4) • **Planning and Carrying Out Investigations** Planning and carrying out investigations to answer questions or test solutions to problems in 3–5 builds on K–2 experiences and progresses to include investigations that control variables and provide evidence to support explanations or design solutions. o Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence, using fair tests in which variables are controlled and the number of trials considered. (3-PS2-1) o Make observations and/or measurements to produce data to serve as the basis for evidence for an explanation of a phenomenon or test a design solution. (3-PS2-2) **<u>Connections to Nature of Science</u>** • **Science Knowledge is Based on Empirical Evidence** o Science findings are based on recognizing patterns. (3-PS2-2) • **Scientific Investigations Use a Variety of Methods** o Science investigations use a variety of methods, tools, and techniques. (3-PS2-1) **<u>Crosscutting Concepts</u>** • **Patterns** o Patterns of change can be used to make predictions. (3-PS2-2) • **Cause and Effect** o Cause and effect relationships are routinely identified. (3-PS2-1) o Cause and effect relationships are routinely identified, tested, and used to explain change. (3-PS2-3) • **Connections to Engineering, Technology, and Applications of Science** • **Interdependence of Science, Engineering, and Technology** o Scientific discoveries about the natural world can often lead to

		new and improved technologies, which are developed through the engineering design process. (3-PS2-4)

Lesson Foundation – Big Ideas & Cross-Curricular Connections

Big Ideas

1. The Sun and the angle of the Sun have an effect on the Earth at different times of the day and year.
2. Taking measurements and temperatures can help you understand why different colored clothing is worn at different times of the year. The student will study how different cultures wear different colors and kinds of clothing according to the time of year and the closeness of the sun.

Cross-Curricular Connections

All connections will revolve around the students' study of the effects of the sun and how different colors absorb heat differently. Students will use their math and language skills to measure, calculate, graph, and discuss how different angles of the sun at various times of the day have different effects on various colors of paper containing blocks of ice. The student will relate this and research how different cultures have different types of clothing and how that relates to their season and location of the sun. They will write about their findings and comparisons of clothing within different cultures and how the various colors relate to the angle of the sun and the time of year.

Lesson Foundation – Essential Questions

1. What is solar power and how can it be used?
2. Why is it important to wear different colored clothing depending on the time of the year?
3. Why is it important to know the angle of the sun at different times of the day and year?
4. Which of the three pockets reflected the most light?
5. Why do different cultures wear different types of clothing?
6. What is the difference in various weights of clothing throughout the year?

Lesson Foundation – Student Objectives

Going Beyond	• I can use a thermometer to compare the temperatures collected from three different times of the day and from different angles of the sun. • I can graph the temperatures collected from the data using a line plot. • I can hypothesize which color paper will the ice melt in first. • I can determine why different cultures wear different types of clothing according to the location to the sun and the time of the year.
Mastery	• I can compare and contrast how color affects energy absorption and why it is necessary to wear the appropriate clothing according to the angle of the sun and the time of the year. • I can graph various temperature data. • I can determine how the angle of the sun, the time of day, and the seasons play a role in the position of the sun. • I can determine why different colors are worn for different parts of the year. • I can determine why it is important to change the angle of solar panels according to the time of day and time of year to obtain the maximum benefit of the heat source.
Building the Basics	• I can use a thermometer to collect the temperature at different times of the day. • I can measure the time it takes for the ice to melt in the different colors of paper.

	• I can use an IPAD to record my data. • I can use a computer to complete research into the different types of clothing and weight of clothing worn in different cultures according to the location of the sun and the time of the year.
Lesson Foundations – Prerequisite Content & Skills	
Content Knowledge	• Observe the world of familiar objects using the senses and tools. • Ask questions, make logical predictions, plan investigations, and represent data. • Communicate interest in simple phenomena and plan for simple investigations. • Communicate understanding of simple data using age-appropriate vocabulary. • Recognize that both natural materials and human-made tools have specific characteristics that determine their uses. • Apply engineering design and creative thinking to solve practical problems • Explain how simple tools are used to extend the senses, make life easier, and solve everyday problems. • Use tools to measure materials and construct simple products. • Investigate the effect of the sun on land, water, and air. • Predict and determine what happens over the course of a school day when containers of sand, soil, and water with thermometers are placed in a sunny window. • Predict and determine what happens over the course of a school day when containers of sand, soil and water with thermometers are placed in a shady location. • Compare the temperature at different places around the school such as black top driveway, lawn, concrete areas, side of the building, under a shade tree, wet area, in the ground.
Skills	• Students must have basic knowledge of how to read a thermometer and record data. • Knowing how to use a graph and IPAD for taking pictures to record the information. • Students will need to know how to use the computer in order to complete research on the various types of clothing from different cultures.
Unit Anchor Text	
Unit Anchor Text	• *Clothes Around The World* by Godfrey Hall • *Clothing Around The World* by Kelly Doudra • *Dress In detail From Around The World* by Rosemary Crill
Unit Companion Texts	
Informational Text(s)	• *What We Wear: Dressing Up Around the World* by Maya Ajmera • *Clothes in Many Cultures (Life Around the World)* by Heather Adamson • *Clothing and Jewelry (Discovering World Cultures)* by Fiona MacDonald • *Children Just Like Me: Celebration of Children Around the World* by Anabel Kindersley

Assessments

Formative Assessments	• Teacher observation during experiment and calculations. • Participation during group work. • Independent work and class interaction during discussion. • Paying attention during the class power point presentations. • Participation during research and the preparation of their written report.
Summative Assessments	• The students will be graded on their presentations, which should include their hypothesis, findings, and how their results compared with their hypothesis. • They will also receive a grade from the research on different types of clothing worn in various other cultures and how they compare to the clothing the student's wear. • Their presentation will be presented using a poster board. (See Rubric for scoring) • The students will also take a reading test from the book selections read.
Writing Assessments	The student will write about the data collected comparing the absorption of the sun on the various colors of paper. They will begin with a hypothesis and then defend their research after collecting data. They will complete the experiments by using the data to prepare a power point presentation to be presented in conjunction with a paper. They will write about their findings and comparisons of clothing within different cultures and how the various colors relate to the angle of the sun and the time of year.

Unit Vocabulary

Term	Definition
Absorb	To take in.
Insulation	Can hold heat or cold in or out.
Wool	Thick hair of sheep and other animals that is used to make clothing. The wool holds the body heat in.
Corduroy	Corded fabric used to make clothing, which holds body heat in and is worn during cold weather.
Cotton	Woven fibers made into fabric, which allows the body to stay cool.
Temperature	How hot or cold something is.
Garment	An article of clothing
Equator	The imaginary line running around the middle of the Earth.

Teaching the Unit

Initial Strategies	Students will be placed in pairs and given one of seven colors of construction paper, white, black, yellow, orange, purple, green and blue. The students will be encouraged to write a hypothesis in their science journal about which color of paper will absorb the most heat causing the block of ice to melt the quickest. Next, each student will use a scientific method to investigate his or her hypothesis. Each student pair will have a record sheet to use for their collection of data. The students will participate is a group discussion about their hypothesis' following their experiments at the end of the week. They will present a power point presentation of the data findings, create a poster board presentation to accompany their written report of the findings from doing research on different types of clothing worn in different cultures
Direct Instruction	

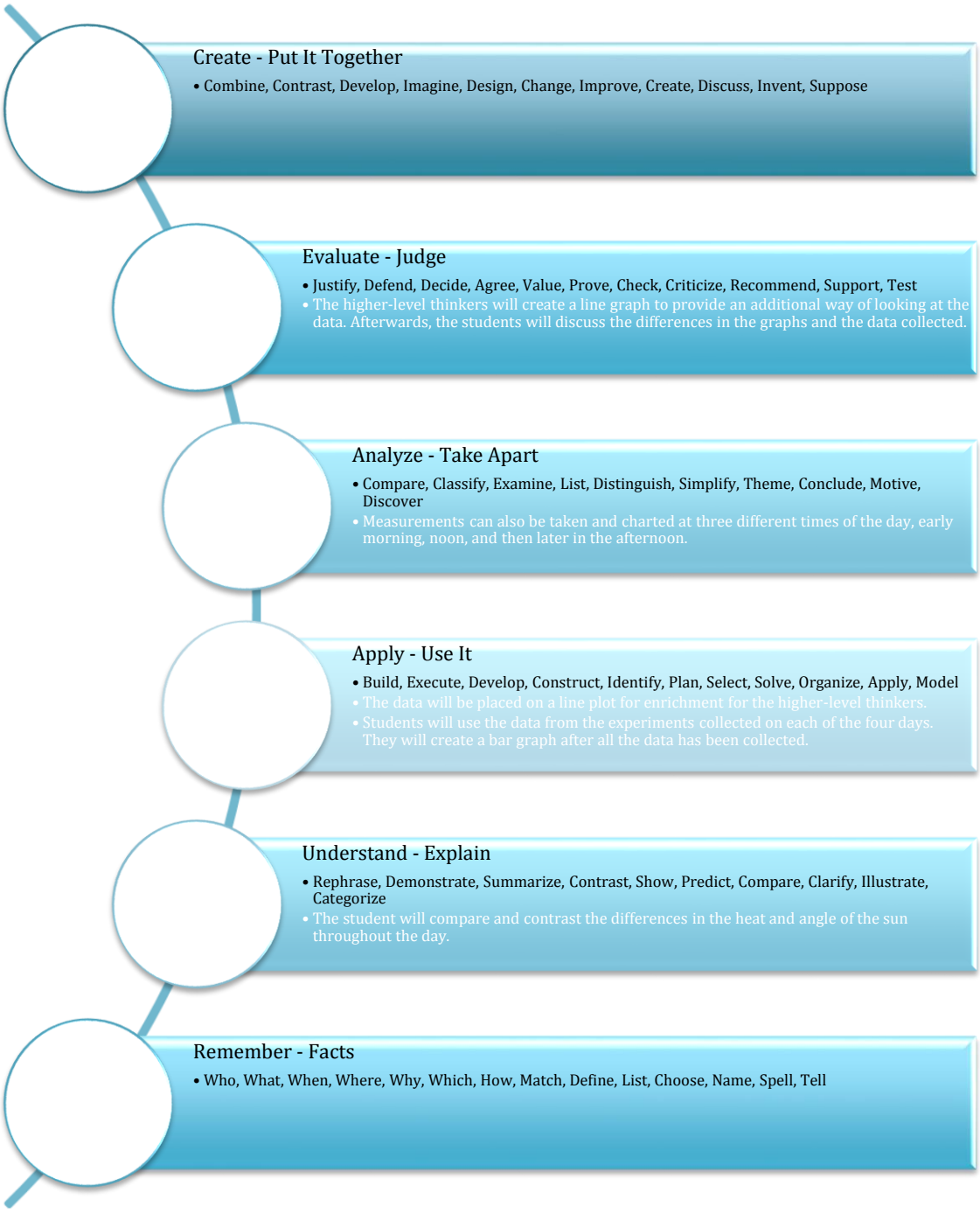
Day	
1	**<u>Science:</u>** Introduce the lesson by using a KWL chart on an anchor chart to organize the information students know about solar energy. Next, make another chart in order to record the answers to the following questions. Questions: 1. Does what you wear make a difference on how hot or cold you are? 2. What are some of your favorite colors of clothing? 3. What color do you think is hotter and what color is cooler or does it matter? 4. Do all colors absorb the same amounts of heat? After the questions have been noted on the chart paper, the students will watch a **brain pop video** on Solar Energy. **<u>Writing:</u>** The students will write their hypothesis in a science journal about what they expect to find during the experiment about which color absorbs the most heat to make a block of ice melt the quickest. They will review the process of using the computer to research the clothing worn in different cultures and how the fashions relate to the time of year and the angle of the sun. **<u>Math:</u>** Students will be shown the bar graph and will review how to chart their data as it is collected each day. **<u>Social Studies:</u>** Solar Power Station, Australia: Student will be able to visualize what a solar power station looks like. This is help the students have an understanding of solar power being located in various places around the world. Discuss the differences in the climate compared to the region they are located in. Students will view pictures of different clothing types from Australia and various cultures. They will begin to discuss the similarities and differences. **<u>Reading:</u>** Read and discuss the book *<u>What We Wear: Dressing Up Around the World.</u>* Introduce the vocabulary using a foldable to write the words. Students then will be divided into pairs and each will be given all the colors of construction paper. The papers will be folded into an envelope shape and be ready to begin the experiments on each of the next four days. A chart for each of the four days of experiments will need to be prepared ahead of time, on poster board. The chart will need a listing of each color

		and day of the experiments, the time the envelope is put in the sun, time taken out of the sun, how long it was left in the sun, temperature before they were put out in the sun, temperature after one hour, and the difference in temperature. **Extra Activities:** The students can have an opportunity to play the solar energy games included in the lesson plans. These games could be used anytime throughout the week to fill time, for the early finishers. ***Students will work on their research through the week as time permits.
	2	**Science:** The pair of students will collect two different colors of their folded construction paper envelopes and place a thermometer inside each envelope. The envelope will be taped to a piece of cardboard and the cardboard will be placed outside in the sun. They will begin recording their data on their individual record sheet. After the envelopes have been in the sun for one hour, the students will return outside and record their new findings. **Math:** Students will record their results on their record sheet. The students will begin to transfer their findings onto their individual bar graphs from the record sheet. They will find the difference in the two temperatures from the two colors of construction paper. **Reading:** Students will compare and contrast using a Venn diagram what the difference in the temperatures of the two colors of construction paper. **Social Studies:** Students will compare and contrast the differences in types of clothing they wear in the four seasons they experience. They will look at pictures of other cultures wear and compare that. Watch **Clothing Around the World**. **Writing/Language:** Have the students write about their findings in their science journals using adjectives to describe what they observed. They will need to include the differences they observed in the temperatures of the different colors of paper and which began melting the quickest. They will continue working on their research to determine the different types of clothing worn in different cultures determining the differences according to the angle of the sun and time of the year. **Homework**: Students will write their vocabulary definitions in their foldable. Begin working on the poster board presentation of the clothing types.
	3	**Science:**

		Begin the lesson by reading *Clothes in Many Cultures (Life Around the World)* and have a class discussion. Students will repeat the same experiments outside as the day before. Each pair will use a different color paper from the previous day. **Math**: Data will be collected and recorded on the student record sheet and then transferred to the poster board as the class discussion takes place. Once again the students will record their results onto their bar graphs. They will also find the difference in the temperatures of their colors of construction paper. After finding the differences, they will compare the temperatures of the two days put together. **Writing/Language**: Have the students to use adjectives as they describe their findings in their science journal. They will be asked to compare the temperatures of the two days' findings and describe if they see a trend in their findings. The students will work on the computer and do research of different types of clothing from the various cultures. **Social Studies:** Compare the seasons to the position of the solar panels. Discuss how the different places around the world would have to change the position of the solar panels depending on the season and angle of the sun. Discuss how the continents would have different means of solar energy. Have the students list the different types of clothing worn in relationship to the different angles of the sun and the time of the year. Include information to the relationship of the sun to the equator and the different types of clothing needed in relation to the equator. This information can be used in their written reports. **Reading:** Read *Clothing and Jewelry (Discovering World Cultures)* and discuss. Tie the story into the different types of clothing found throughout different cultures. **Homework**: Continue working on the poster board presentation.
	4	**Science/Reading:** Begin the lesson by reading and discussing *Children Just Like Me: A Unique Celebration of Children Around the World.* Students will repeat the same experiment outside. Each pair of students will use their last two colors of paper and completing the experiment of all the colors included in the project. **Math:** Students will record their findings on their record sheets. They will find the differences in their colors of construction paper. They will also compare and contrast all of their findings throughout the week. After charting their findings on the poster board the class has been

		constructing throughout the week, they will add their information to their bar graphs and compare their findings throughout the week. **<u>Writing/Language</u>**: Students will add entries to their science journal describing the findings of their final experiment. They will be asked to list the differences they recorded from day to day. They will also compare the similarities and differences. Next, the pair of students will go to the computers and prepare a power point presentation of their findings to be presented to the class. The research of the clothing from different cultures will also be completed and be presented to the classroom on the next day. Students will have an opportunity to complete a poster board presentation to accompany the written report if needed.
	5	The lesson will cumulate with students presenting Power Point presentations of their findings. They will state their hypothesis and determine if they were correct or incorrect. The presentations should include the data, the bar graph, and the comparisons of the data. In the written research, the student will relate their findings to the different types of clothing worn in various temperatures and times of the year. They should have a good grasp of the knowledge that dark color clothing will hold more heat in and is mostly worn in colder areas and winter. Clothing of lighter colors will be cooler. This type of clothing is mostly worn in warmer areas and during the summer. They will use a poster board to illustrate their findings of the different types of clothing found in different cultures and compare the seasons and angle of the sun. Students will have a test over the books read throughout the week as a cumulative review. Complete the KWL chart and review the questions that were asked on Day 1. Compare their answers to what they were when asked the first time.

Higher-Level Cognitive Function Strategies



Guided Practice & Activities	**DAY 1** **Science:** The lesson on Solar Energy will be introduced using a KWL chart on anchor chart paper. This will be completed at the end of the week as the lesson is completed. Watch a brain pop video on solar energy. **Language/Writing:** The students will write their hypothesis in a science journal about what they expect to find during the experiments about which color absorbs the most heat to make a block of ice melt the quickest. Students will be reminded about proper grammar, writing in complete sentences, and using the correct punctuation. They will begin working on the research of the different types of clothing worn in different cultures. **Reading:** A literacy circle will gather to read and discuss *What We Wear: Dressing Up Around the World*. Students will be introduced to the vocabulary and will create a foldable to have to use as a study guide through out the week to prepare for the test. They will write their words in the foldable. **Social Studies:** Solar Power Station, Australia: Student will be able to visualize what a solar power station looks like. This is help the students have an understanding of solar power being located in various places around the world. Discuss the differences in the climate compared to the region they are located in. Students will view pictures of different clothing types from Australia and various cultures. They will begin to discuss the similarities and differences. **Math:** Students will be shown the bar graph that will be used through out the week for data collection. They will review how to create a bar graph. **DAY 2** **Science:** Pairs of students will collect their necessary tools to begin the experiment. They will set their construction paper envelopes and thermometers outside to begin collecting data. After one hour the students will return with their record sheet in order to record their findings. **Math:** Students will collect their record where data was collected during science. The data will then be transferred onto their individual bar graphs. **Reading:** Students will use a Venn diagram to compare and contrast the differences they found in the two colors of construction paper during the literacy groups. They will determine which color melted the quickest. Students will also review their vocabulary words and for homework. They will be asked to write their vocabulary definitions in their foldable. **Social Studies:** Students will compare and contrast the differences in types of clothing they wear in the four seasons they experience. They will look at pictures of other cultures wear and compare that.

Watch **Clothing Around the World**.

Writing/Language:
Have the students write about their findings in their science journals using adjectives to describe what they observed. They will need to include the differences they observed in the temperatures of the different colors of paper and which began melting the quickest. They will continue working on their research to determine the different types of clothing worn in different cultures determining the differences according to the angle of the sun and time of the year.

DAY 3

Science:
Begin the lesson by reading *Clothes in Many Cultures (Life Around the World)* and have a class discussion. Students will repeat the same experiments outside as the day before. Each pair will use a different color paper from the previous day.

Math:
The students will use the collected data from the record sheets in order to graph their findings. They will also find the differences in all of the colors of paper used to this point of the lesson. They will also compare the temperatures of the two days put together.

Writing/Language:
Have the students to use adjectives as they describe their findings in their science journal. They will be asked to compare the temperatures of the two days' findings and describe if they see a trend in their findings. The students will work on the computer and do research of different types of clothing from the various cultures.

Social Studies:
Compare the seasons to the position of the solar panels. Discuss how the different places around the world would have to change the position of the solar panels depending on the season and angle of the sun. Discuss how the continents would have different means of solar energy. Have the students list the different types of clothing worn in relationship to the different angles of the sun and the time of the year. Include information to the relationship of the sun to the equator and the different types of clothing needed in relation to the equator. This information can be used in their written reports.

Reading:
Clothing and Jewelry (Discovering World Cultures) and discuss this. Tie this into the different types of clothing throughout different cultures.

Homework:
Use the vocabulary words from their foldable in a sentence. Continue working on the poster board presentation.

DAY 4

Science/Reading:
Begin the lesson by reading and discussing *Children Just Like Me: A Unique Celebration of Children Around the World.* Students will repeat the same experiment outside. Each pair of students will use their last two colors of paper and completing the experiment of all the colors included in the project.

	Math: Students will record their findings on their record sheets. They will find the differences in their colors of construction paper. They will also compare and contrast all of their findings throughout the week. After charting their findings on the poster board the class has been constructing throughout the week, they will add their information to their bar graphs and compare their findings throughout the week. **Writing/Language**: Students will add entries to their science journal describing the findings of their final experiment. They will be asked to list the differences they recorded from day to day. They will also compare the similarities and differences. Next, the pair of students will go to the computers and prepare a power point presentation of their findings to be presented to the class. The research of the clothing from different cultures will also be completed and be presented to the classroom on the next day. Students will have an opportunity to complete a poster board presentation to accompany the written report if needed. **DAY 5** The lesson will cumulate with students presenting Power Point presentations of their findings. They will state their hypothesis and determine if they were correct or incorrect. The presentations should include the data, the bar graph, and the comparisons of the data. In the written research, the student will relate their findings to the different types of clothing worn in various temperatures and times of the year. They should have a good grasp of the knowledge that dark color clothing will hold more heat in and is mostly worn in colder areas and winter. Clothing of lighter colors will be cooler. This type of clothing is mostly worn in warmer areas and during the summer. They will use a poster board to illustrate their findings of the different types of clothing found in different cultures and compare the seasons and angle of the sun. Students will have a test over the books read throughout the week as a cumulative review. Complete the KWL chart and review the questions that were asked on Day 1. Compare their answers to what they were when asked the first time.
STEM Projects	• The students will use an IPAD/IPOD in order to take pictures of their experiments to use as part of their power point presentations of their experimental findings. • The students will make a Power Point using the data from their experiments to present to the class. The students will use the computer in order to do research on the different types of clothing worn in different cultures during various times of the year. They will illustrate their findings on a poster board to accompany their written report.
STEM Culminating Event	• Students will present a Power Point presentation to the class. They will include pictures taken from the IPAD/IPOD. Students are to state their hypothesis and justify their findings. They will state whether their hypothesis was correct or incorrect. • After the presentations, students will analyze all the information to determine if there were any similarities or differences in the various data gathered. Next, they will present their written report and poster board to illustrate their findings on the different types of clothing worn in different cultures in the various times of the year.

Differentiated Instruction	• Writing – Students with poor motor skills can use an IPAD to type their science journal entries and email them to the teacher. The writing assignments will be altered to accommodate different learners. Students who have difficulty with subtraction will be allowed to use a calculator and a digital thermometer in order to help make the readings easier. • Small groups and students being placed in pairs will allow for peer collaboration and tutoring for struggling students. • Students will be provided with leveled books and articles about solar energy.
Re-teaching Strategies	• Students will work on reading a thermometer in order to collect data accurately or will be given a digital thermometer. • Students will have additional instruction on the making of a Power Point presentation and if necessary, student collaboration and peer tutoring will take place. Students will have additional instruction on the finding of the research and will be allowed to have peer collaboration and assistance in finding the correct information.
Enrichment Strategies	• Students will do the experiments at three different times of the day to collect the data using different times and angles of the sun. This data will be compared to determine the difference in the times. The new data would be recorded on a line plot graph rather than a bar graph.
Independent Practice Activities	• Students will read books and articles on solar power. • Students will read books and articles on clothing and styles in different cultures. • Students will write a paper on clothing worn in different cultures. They will compare and contrast the types of clothing they wear during different seasons to that of other cultures. • Students will make a list of how they can conserve energy in their environment. • Students will practice their math skills. • Students will use a Venn diagram to compare and contrast the differences they found in the two colors of construction paper during the literacy groups. They will determine which color melted the quickest. • Students will play the solar energy games to determine the different temperatures of solar power.
Materials & Resources	**Materials** 1. Construction Paper – colors needed, blue, white, green, black, yellow, purple and orange (1 of each color per student) 2. Thermometers – 1 per student 3. Cardboard 4. Large slabs of ice 5. Paper for the bar graphs for each pair of children 6. 4 pieces of poster board to make master chart of daily experiments. 7. Record sheet – 1 per group of pair 8. Crayons/Markers – for the bar graph 9. Venn Diagrams 10. Smart board- 11. IPADS/IPODS 12. Computers 13. Anchor Chart Paper 14. Pencils 15. Poster board per pair

	Technology Hardware
	iPad iPod Computer SMART Board Power Point
	Technology Software
	"TeslaTown" is an app for 3rd grade to explore different sources of power. Educreation Solar Power Station, Australia Clothing Around the World Energy Quest Game Solar Energy Defenders Game
Comments	If you have an questions you may contact: Rhonda McConnell at Rhonda.mcconnell@sullivank12tn.net Jessica Carr at jessicawcarr@hotmail.com