

Finding a Narrative

Emotional Engagement	Central Image or Metaphor	Organizing Content into Story Form
<p>What is emotionally engaging about the topic? How is it meaningful? Why should it matter to us?</p> <p>Humans can both have power over heat, and be subject to its destructive power. Heat, then, is emotionally engaging because, although it is so important to us, it can also be devastating.</p> <p>What binary concepts best capture the meaning and emotion of the topic? If this were a story, what would the opposing forces be?</p> <p>Heat as helper/ destroyer Alternative: hot/ cold</p>	<p>What content most dramatically illustrates the contrast between the binary opposite? Is there a metaphor or image that can do this?</p> <p>A candle and a volcano</p> <p>A hearth fire and a forest fire</p> <p>A sunny garden and a desert</p>	<p>How can we organize the content into a developing story form?</p> <p>We will want our unit to develop around the conflict created by heat as a destroyer. We might begin, then, by giving students a sense of the negative effects heat can have on humans, animals and the Earth. We might retell the Greek myths which illustrate the vital importance of heat to human life, especially those which highlight its destructiveness, or ask for childhood stories of the first time a student touched the flame of a candle or fire. We could provide other examples of extreme danger caused by heat, such as forest fires, heat waves or scalding the skin from steam.</p> <p>The middle of the unit will be organized around experiments which highlight heat as a helper/ destroyer. Examples include heating water and generating steam (which can be connected to Hero of Alexander's steam engine), or by using silver or matt black reflectors, measuring the temperature of water which has stood in the sun for some time (this can be connected to inventions used to keep space ships and astronauts from burning in space). Convection and conservation could also be examined, as can volcanic processes.</p> <p>We will want students to see that when it is predictable, and appropriately harnessed, heat is extremely beneficial to humans, but that it always has the potential to elude our control.</p>

Developing Cognitive Tools

The Power of Heat

Images and Metaphor	Rhythm, Rhyme and Patterns	Drama and Roleplay	Teacher - led/structured ↕ Student - led/open-ended
<p>What activities help students develop images, metaphors, other forms of creative depiction?</p> <p>What moods are associated with heat? How are the tones of the moods different depending on whether heat is a helper or destroyer (e.g. heat is anger: violent, sudden, scary, relentless; heat is love: comforting, gentle, supportive, expansive)? How would each of these forms of heat look, sound, taste, smell, feel, etc?</p> <p>How is heat represented in various myths (e.g. God of the Sun)?</p> <p>Draw a cartoon sequence in which the main character, Heat, transforms from Helper to Destroyer, when a particular problem is encountered.</p> <p>What jokes or fantastic stories can be found or invented that relate to the topic?</p> <p>Why did the cold cross the road? To get to the oven side!</p>	<p>What activities help students experience and extend a sense of rhythm, rhyme or predictability?</p> <p>We use the predictability of heat in our everyday lives: in warming houses, running engines, cooking food, etc. Students could write "What am I?" riddles for various causes/manifestations of heat (e.g. flames, sunshine, friction).</p> <p>Students could write poems which refer to the natural rhythm of heat in the day or year (e.g. a flower closes at night when it is cold and opens in the day's sunshine; in the spring sap flows and trees blossom, in the fall leaves die and fall to the ground). Conversely, students could draw a cartoon which shows the rhythm of their day in terms of heating/ cooling (e.g. on the playground they may be hot, while reading they may cool).</p> <p>The destructiveness of heat could be demonstrated in movement to music. Heat as helper might be music which is still within our control (has some sense of predictability), while heat which is destructive is out of our control (has become frenetic).</p>	<p>How can the students become characters in the story? How can they be encouraged and aided to contribute to or retell it using their own words, gestures, and actions?</p> <p>Students could dramatize the heat-related Greek myths (Prometheus, Phaeton, Haephestos), or myths from other cultures (e.g. which personify volcanoes, the sun). Students could write the plea of Prometheus, to be released from his terrible, eternal punishment.</p> <p>Students could write skits in which they portray a futuristic world with no heat (e.g. no sunshine, fire, cooking).</p> <p>Students could make 'mannequins' and costumes for heat in its various helpful/ destructive forms (e.g. growing, relaxing, comforting, burning, scalding, boiling, exploding) or draw pictures of the Destroyer Heat and the Helper Heat.</p> <p>Students could write and perform stories, fairy tales, etc. in which heat is a central element.</p>	

Looking Forward and Concluding

The Power of Heat

Towards Further Understanding	Resolution	Assessment
<p><i>How can the unit develop embryonic forms of Romantic, Philosophic, Ironic understanding? What cognitive tools characteristic of literacy, the disciplines, or embodied self-awareness can be introduced here?</i></p> <p>What are the biggest explosions/ disasters caused by heat?</p> <p>Do all cultures have myths about gods/ goddesses of Fire, the Sun, etc.?</p> <p>How can physics explain heat?</p> <p>Do we always know when heat is helpful/ harmful, or can it depend on the context?</p>	<p><i>How does the story end? How are the opposites mediated or resolved?</i></p> <p>Students could display various ways in which heat can be harmful/ beneficial to humans, animals and the Earth. Some forms of heat, of course, can be both harmful and beneficial (nuclear power might be used effectively for human purposes, but it can be destructive in numerous ways). To focus more specifically, students could display all the ways heat is helpful in their everyday lives, and all the ways that this same heat, unchecked, can be destructive.</p> <p>A science fair on heat might be another effective resolution to the unit. Students could perform an experiment about heat and make a display explaining how it works, whether their hypothesis came true, etc. Other classes could be invited to visit each of the heat stations.</p>	<p><i>How can one know whether the topic has been understood, its importance grasped and the content learned?</i></p> <p>Did the student understand that heat is a form of energy that moves from hot objects to cold ones?</p> <p>Did the student understand that the same form of heat can be helpful or harmful?</p> <p>Was the student imaginative in representing heat (e.g. visually, dramatically)?</p> <p>Did the student participate effectively in the experiments, by cooperating with classmates and following appropriate experimental procedures?</p>