

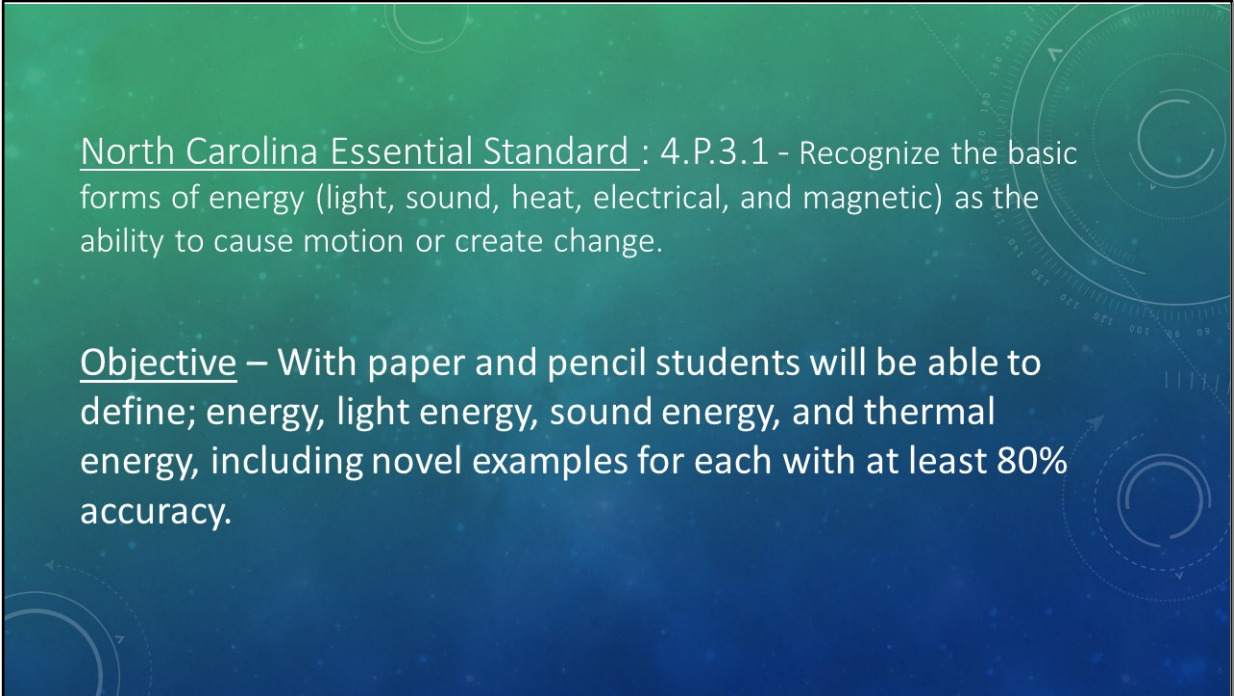
The background of the slide is a gradient from green at the top to blue at the bottom, with faint, stylized circular patterns and arrows, suggesting energy or motion.

# INTRO TO ENERGY

Mrs. Kelsie Kaufmann

Fourth Grade Science

Nov 7-2:07 PM

The background of the slide is a gradient from green at the top to blue at the bottom, with faint, stylized circular patterns and arrows, suggesting energy or motion.

North Carolina Essential Standard : 4.P.3.1 - Recognize the basic forms of energy (light, sound, heat, electrical, and magnetic) as the ability to cause motion or create change.

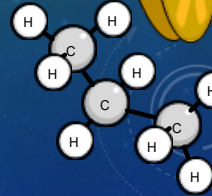
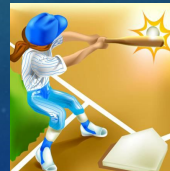
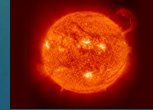
Objective – With paper and pencil students will be able to define; energy, light energy, sound energy, and thermal energy, including novel examples for each with at least 80% accuracy.

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## INTRO TO ENERGY



- Which of these images represent **energy**?  
(circle and explain)



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## INTRO TO ENERGY



## Fundamental Principle of Physics

★ Energy is neither created or destroyed, but is converted from one form to another

➡ (This is why we will be able to identify multiple types of energy in a single image)

Nov 10-1:21 PM

## INTRO TO ENERGY



- What is Energy??

Energy - the ability to cause change or do work

Work – force that causes movement

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## INTRO TO ENERGY



### Types of energy

- Light
- Sound
- Thermal (heat)
- Electrical
- Magnetic

### Energy ...

- Causes change
- Does work – force/movement
- Is conserved (neither created or destroyed) and transfers from one form to another

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## INTRO TO ENERGY



Today we will be exploring

- Light Energy
- Sound Energy
- Thermal (heat) Energy



Identify the light, sound, and thermal energy in this picture

sound → thermal → light →

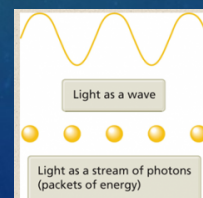
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## INTRO TO ENERGY



**Light Energy** – Light particles (photons) are tiny packets of energy that travel in waves.

Light includes - visible light, sun light, radio waves, microwaves, x-rays and more



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# INTRO TO ENERGY

Another name for light energy

→

Types of Electromagnetic Radiation

radio	microwaves	infrared	visible light	ultraviolet	X-rays	gamma rays
used to broadcast radio and television	used in cooking, radar, telephone and other signals	transmits heat from sun, fires, radiators	makes things able to be seen	absorbed by the skin, used in fluorescent tubes	used to view inside of bodies and objects	used in medicine for killing cancer cells

Can you hypothesize how each example causes change or does work?

Write your response under the corresponding picture

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# INTRO TO ENERGY


- **Sound Energy** – a force that causes vibrations, producing sound waves

(click picture for creative interpretation of sound waves)

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5

INTRO TO ENERGY




Identify what is vibrating (creating sound)

Write answers next to the corresponding arrow



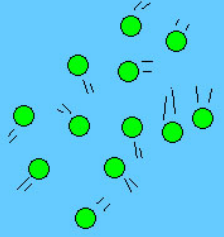
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INTRO TO ENERGY

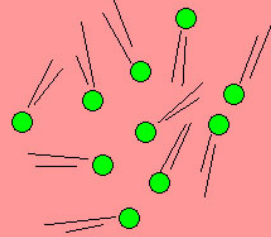


- **Thermal (heat) Energy** – when particles move (vibrate), the energy is released as heat. The more movement the more heat.

low movement =  
low temperature



high movement =  
high temperature



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Edit













Check

Reset

Solve

?

Low Thermal Energy	High Thermal Energy



Explain to class -

- Which part of the image represents thermal energy
- If the particles are moving fast or slow
- What would happen if the thermal energy decreased/increased

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Edit










Check

Reset

Solve

?

Light	Sound	Thermal



Review

- Select and explain reasoning

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Nov 7-2:12 PM

Nov 12-12:12 PM

# INTRO TO ENERGY



## Individual Activity

- In your lab journal -
  - Start a new page with the title “Light, Sound and Thermal Energy”
  - In your own words answer “What is energy?” (full sentence)
  - In your own words define **light**, **sound** and **thermal** energy including an *example or use* of this energy not discussed in class. (min. 3 sentences)
  - After completion you may quietly discuss your examples and uses with your table mates.

Nov 7-2:12 PM

## References

Integrated Teaching and Learning Program, College of Engineering, University of Colorado Boulder. “Lesson: What is Energy?”. Teach Engineering – Curriculum for K-12 Teachers. (2015). Retrieved from [https://www.teachengineering.org/view\\_lesson.php?url=collection/cub\\_/lessons/cub\\_energy2/cub\\_energy2\\_lesson01.xml](https://www.teachengineering.org/view_lesson.php?url=collection/cub_/lessons/cub_energy2/cub_energy2_lesson01.xml)

Pictures found outside of Smart Notebook

Atom Image. Retrieved from [http://it.123rf.com/photo\\_11657391\\_verde-atomo-isolato-su-sfondo-bianco-illustrazione-vettoriale.html](http://it.123rf.com/photo_11657391_verde-atomo-isolato-su-sfondo-bianco-illustrazione-vettoriale.html)

Burner Coil Image. Retrieved from <http://srphotos2.fotosearch.com/othumb/CSP/CSP734/k7348112.jpg>

Firecracker Image. Retrieved from <http://www.polyvore.com/cgi/img-thing?.out=jpg&size=1&tid=37497719>

Light particles/wave Image. Retrieved [http://fce-study.netdna-ssl.com/images/upload-flashcards/398984/593800\\_m.png](http://fce-study.netdna-ssl.com/images/upload-flashcards/398984/593800_m.png)

Light Spectrum Image. Retrieved from <http://media-2.web.britannica.com/eb-media/75/95275-004-DDC8FD08.jpg>

Light Spectrum Review. Retrieve from <http://www.web.blob.core.windows.net/images/VisibleLightSpectrum.jpg>

Megaphone Image. Retrieved from [http://www.cartoon-clipart.com/cartoon\\_clipart\\_images/red\\_megaphone\\_speaker\\_with\\_sound\\_waves\\_coming\\_from\\_it\\_as\\_an\\_announcement\\_is\\_made\\_0515-1003-2513-2218\\_SMU.jpg](http://www.cartoon-clipart.com/cartoon_clipart_images/red_megaphone_speaker_with_sound_waves_coming_from_it_as_an_announcement_is_made_0515-1003-2513-2218_SMU.jpg)

Microwave Image. Retrieved from [http://2.bp.blogspot.com/-IU2GSN8GI44/USe\\_Mkxal7I/AAAAAAAAI7E/DE477T2K0yY/s400/59\\_microwave.jpg](http://2.bp.blogspot.com/-IU2GSN8GI44/USe_Mkxal7I/AAAAAAAAI7E/DE477T2K0yY/s400/59_microwave.jpg)

Particle Movement with Description Image. Retrieved from <http://marinescienceastein.weebly.com/uploads/1/1/0/2/11022434/8725887.jpg>

Particle Speed Image. Retrieved from [http://cse.ssl.berkeley.edu/bmendez/ay10/2002/notes/pics/bt2lf0404\\_a.jpg](http://cse.ssl.berkeley.edu/bmendez/ay10/2002/notes/pics/bt2lf0404_a.jpg)





Sound Wave Image. Retrieved from <https://s-media-cache-ak0.pinimg.com/736x/60/e4/d9/60e4d91be6d106d17219f5e859765a29.jpg>

Teapot Image. Retrieved from <http://il5.picdn.net/shutterstock/videos/3740015/thumb/1.jpg>

Nov 7-2:12 PM

Attachments

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-  tempmovement.jpg
-  fast.png
-  megaphone.jpg
-  loudspeaker-waveform.gif