4th Grade Waves and their Applications Resources

Next Generation Science Standards:

PS4.A: Wave Properties

Waves, which are regular patterns of motion, can be made in water by disturbing the surface. When waves move across the surface of deep water, the water goes up and down in place; there is no net motion in the direction of the wave except when the water meets a beach. (4-PS4- 1)

Waves of the same type can differ in amplitude (height of the wave) and wavelength (spacing between wave peaks). (4-PS4-1)

PS4.B: Electromagnetic Radiation

An object can be seen when light reflected from its surface enters the eyes. (4-PS4-2)

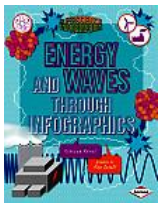
PS4.C: Information Technologies and Instrumentation

Digitized information can be transmitted over long distances without significant degradation. High-tech devices, such as computers or cell phones, can receive and decode information—convert it from digitized form to voice—and vice versa. (4-PS4-3)

Books

Energy and Waves Through Infographics by Rebecca Rowell (2014)

Includes bibliographical references (page 31) and index. Displays the facts about energy and waves, discussing energy sources, the power grid, splitting atoms, sound waves, energy use, and saving energy. Includes charts, maps, illustrations, and timelines.

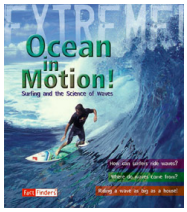


Guided Reading: Q

32 Pages

Ocean in Motion: Surfing and the Science of Waves by Paul Mason (2009)

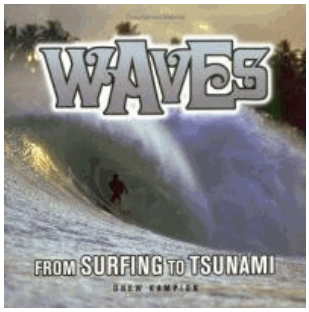
Includes bibliographical references (p. 31) and index.;The biggest ride? -- Where waves come from -- Friend and foe -- How waves break -- Catching a wave -- Turning -- Welcome to the Green Room -- Riding big waves -- Tow-in surfing -- Wiping out -- Water like concrete -- Brr! Ice-cold surfing -- Ripped away. Examines the science behind ocean waves and the sport of surfing.



Guided Reading: Q

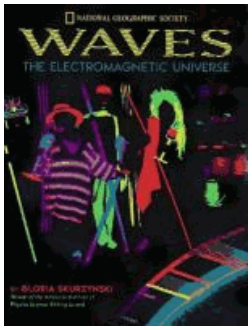
32 Pages

Waves: From Surfing to Tsunami by Drew Kampion (2005)
Takes a look at how waves form, what moves them and why they are important.



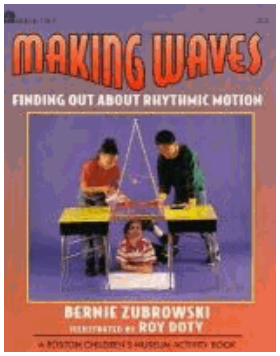
Guided Reading: n/a
79 Pages

Waves: The Electromagnetic Universe by Gloria Skurzynski (1996)
Examines different kinds of electromagnetic waves, including radio waves, microwaves, light, x-rays and gamma rays.



Guided Reading: n/a
48 Pages

Making Waves: Finding Out About Rhythmic Motion by Bernie Zubrowski (1994)
Step-by-step instructions are provided to build wave generators, bubble domes, and eighty-legged centipedes and then use the devices to do more than fifty ingenious experiments which demonstrate how wave energy travels through matter.



Guided Reading:
96 Pages

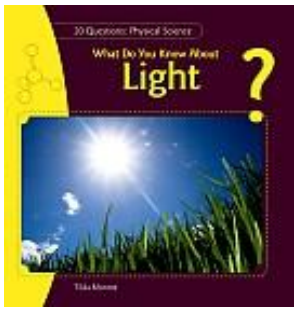
What Makes an Ocean Wave by Melvin and Gilda Berger (2000)
Provides information about various aspects of the world's oceans--waves, tides, the food chain, marine creatures, coastlines, and more.

Guided Reading: S
48 Pages

Light by Mari Schuh (2008)
Includes bibliographical references (p. 23) and index. Light -- Light moves in waves -- Light and color -- Properties of light -- What is Light? -- Sources of light -- Light rays -- Reflection. Explains introductory physical science concepts about light through real-world observation and simple scientific diagrams.

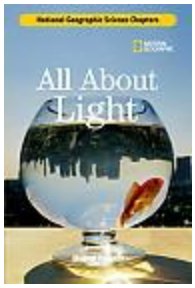
Guided Reading: N
24 Pages

What Do You Know About Light by Tilda Monroe (2011)
Includes index. Provides an introduction to light and includes answers to twenty questions about it.



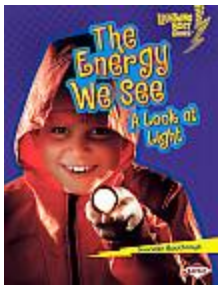
Guided Reading: P
24 Pages

All About Light by Monica Halpern (2006)
Sunlight, animal light, artificial light, the speed of light; reflection, refraction, shadows, colors, wavelengths--all explained in a new and illuminating book. Includes bibliographical references (p. 39) and index. Introduces the physics of light, discussing sources, shadows, color, and other related topics. Includes experiments.



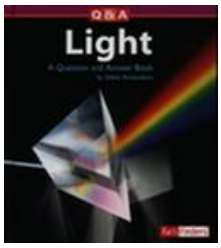
Guided Reading: N
40 Pages

The Energy We See: A Look at Light by Jennifer Boothroyd (2011)
Includes bibliographical references (p. 31) and index.;What is light? -- How light travels -- Light stops here -- Just passing through -- Colors -- Activity. Photographs and text provide a scientific introduction to light, explaining what light is, where it comes from, and how it travels.



Guided Reading: O
32 Pages

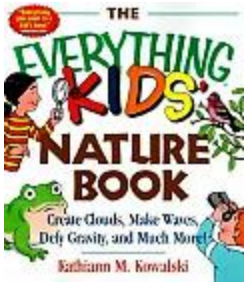
Light: A Question and Answer Book by Adele Richardson (2006)
Includes bibliographical references (p. 31) and index. Discusses light's sources, components, forms, and movement, as well as humans' perception of light, in a question and answer format, and includes "fast facts" and an experiment on how light bounces with reflection and refraction.



Guided Reading: Q
32 Pages

The Everything Kids' Nature Book : create clouds, make waves, defy gravity and much more! by Kathiann Kowalski (2000)

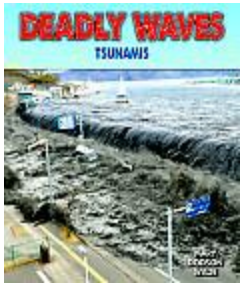
Includes bibliographical references (p. 125-127) and index. Presents a nature activity book for kids that explores rain forests, grasslands, deserts, oceans and rivers, and other natural habitats.



Guided Reading: N
132 Pages

Deadly Waves: Tsunamis by Mary Dodson Wade (2013)

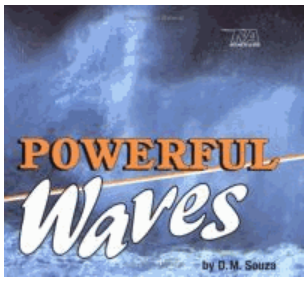
Includes bibliographical references and index. "Examines tsunamis, including how they form and where they occur, what scientists can do to predict them, and stories from survivors and witnesses to tsunamis around the world.



Guided Reading: T
48 Pages

Powerful Waves by D.M. Souza (1992)

Facts about ordinary waves precede information about the causes of the huge waves known as tsunamis and the destruction they bring.



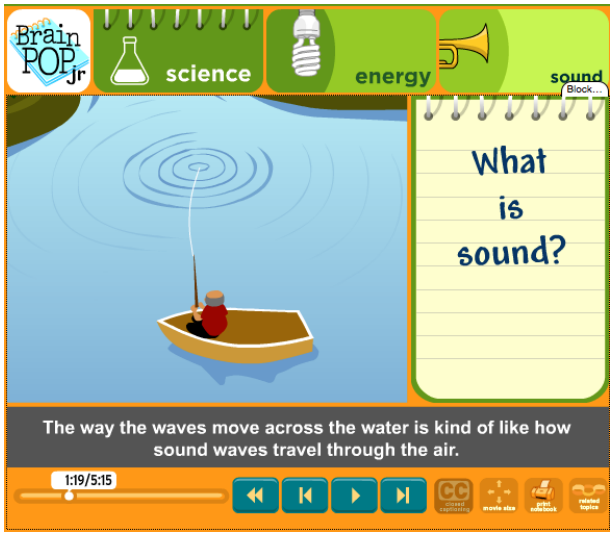
Guided Reading: S
48 Pages

Digital Resources

Databases: (To access these databases remotely, ask your librarian for your school's username and password.)

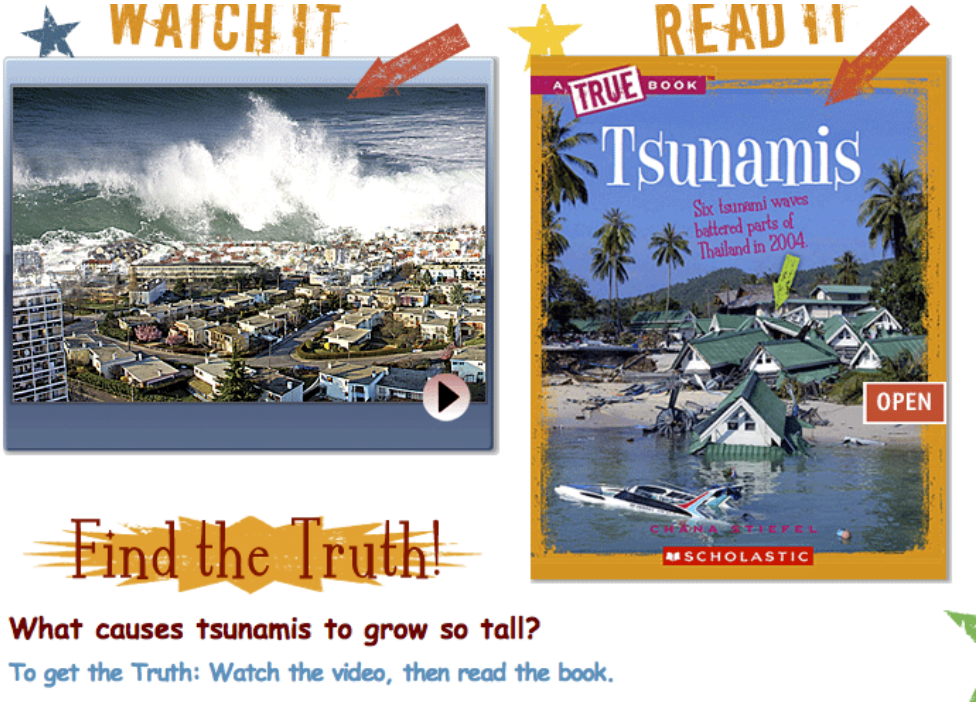
Brainpop Jr.: *Brainpop, Jr. is a database that provides a 3-6 minute video on informational topics followed by a comprehension quiz. The database includes activities and lesson plans as well. It is geared towards grades K-3.*

These are the videos offered by Brainpop Jr. that support Next Generation Science Standards on Waves for 4th Grade. Two different online quizzes are offered after each video to check for understanding. They are entitled "Easy" and "Hard" with 5 questions each.



TrueFlix: *Trueflix is a database that includes non-fiction electronic books. Within each selected book you will find a 3-6 minute informational video on the subject, and a list of recommended websites.*

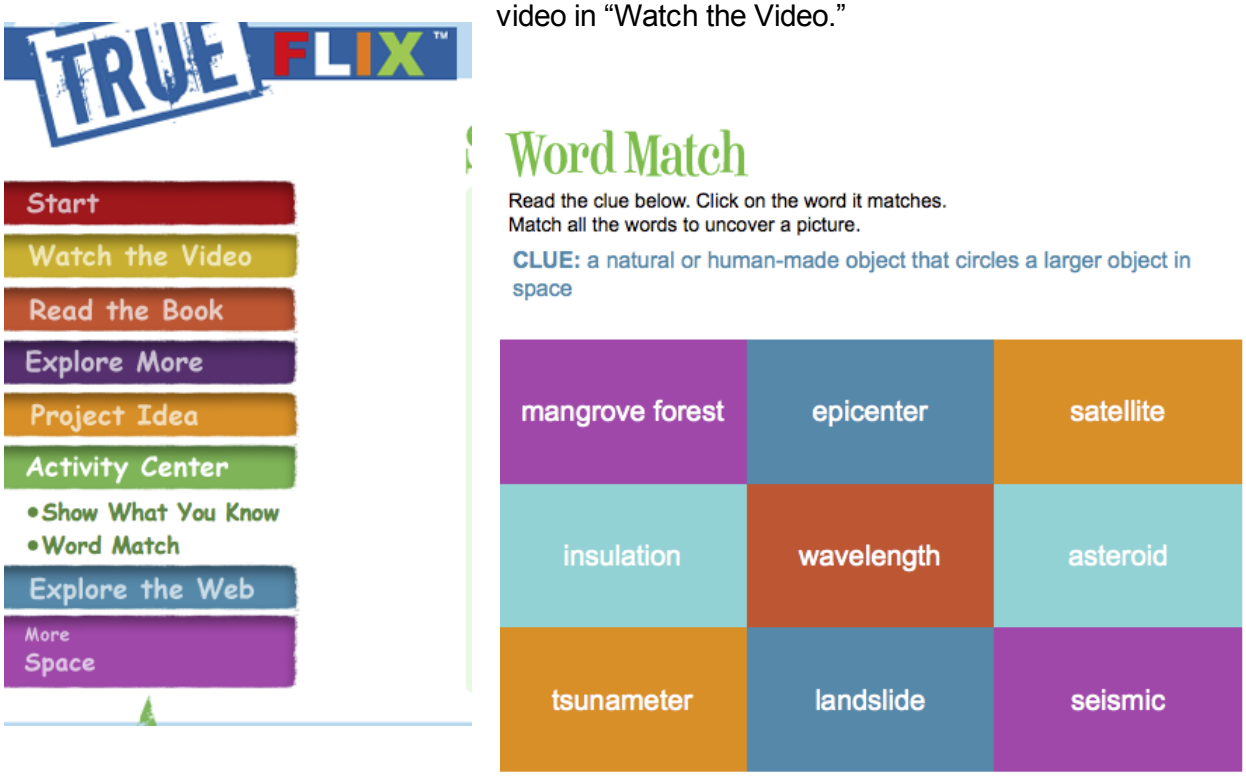
Trueflix contains this book which support the Next Generation Science Standards on Waves and their properties for 4th Grade. The book is 48 pages long, and includes a "Read-Along" button which highlights each word as it is read aloud.



This is the contents page of *Tsunamis*:

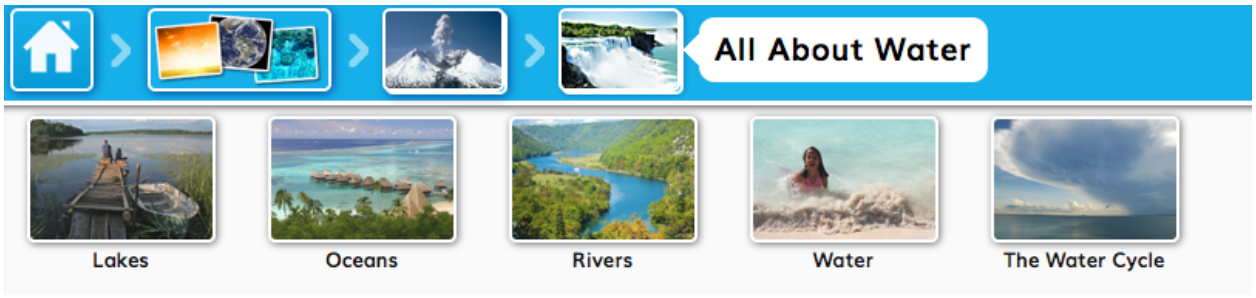
Each subject in *Trueflix* has a part called “Show What You Know.” This is a ten question quiz that can be used to check understanding from the text.

Trueflix also offers word match activity that can be done online. Word match gives a clue that can then be matched with a key word from the text. As you can see from the toolbar on the left, there are project ideas for the classroom, a list of other non-fiction resources on the same topic in “Explore More,” related websites that have been tested and recommended, and a 3-6 minute video in “Watch the Video.”

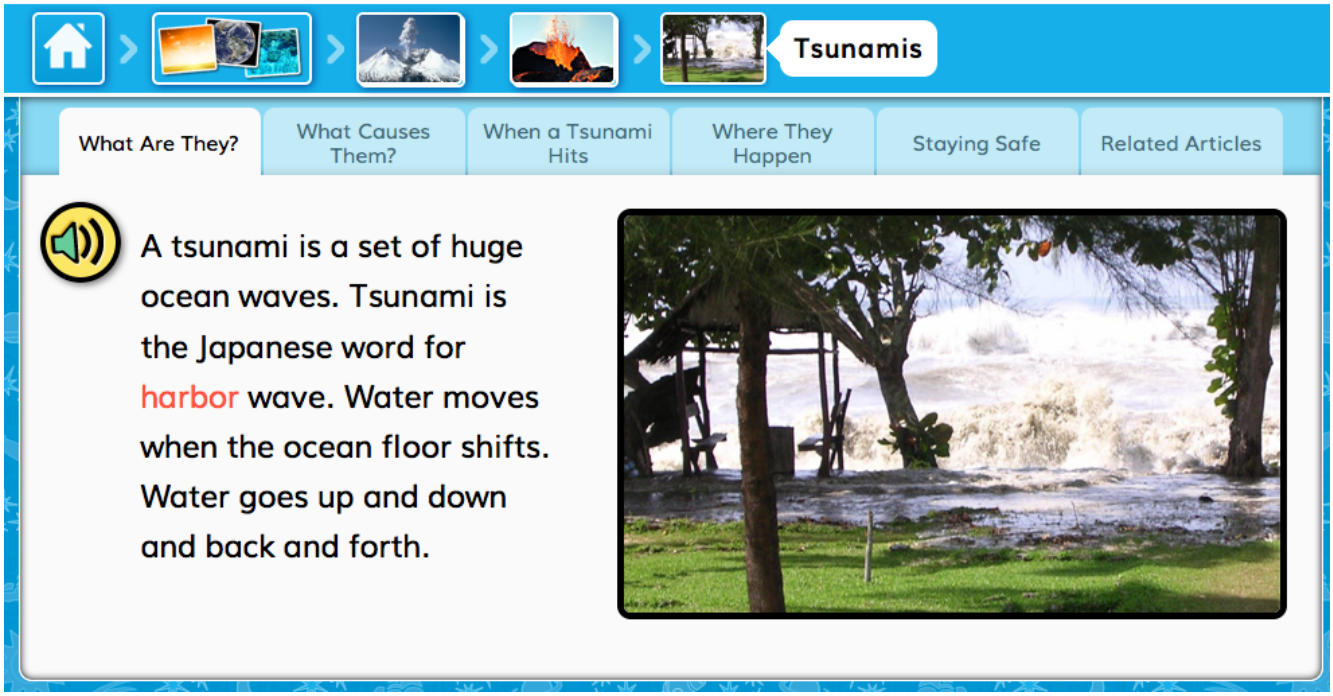


Pebble Go!: *Pebble Go is a database that includes non-fiction books, videos and activities. The target audience for Pebble Go is Kindergarten through 3rd grade, however Pebble Go can be a great way to pique interest in a topic for 4th and 5th graders. Each book is 5 pages long and includes a read-aloud button that highlights each word as it reads aloud. There are often one or two very short videos on the topic embedded within each book.*

There are several Pebble Go sections which align with the Next Generation Science Standards for 4th Grade on Waves and their Applications. Within Pebble Go's Earth and Space you will find a section called "All About Water." Its contents look like this:

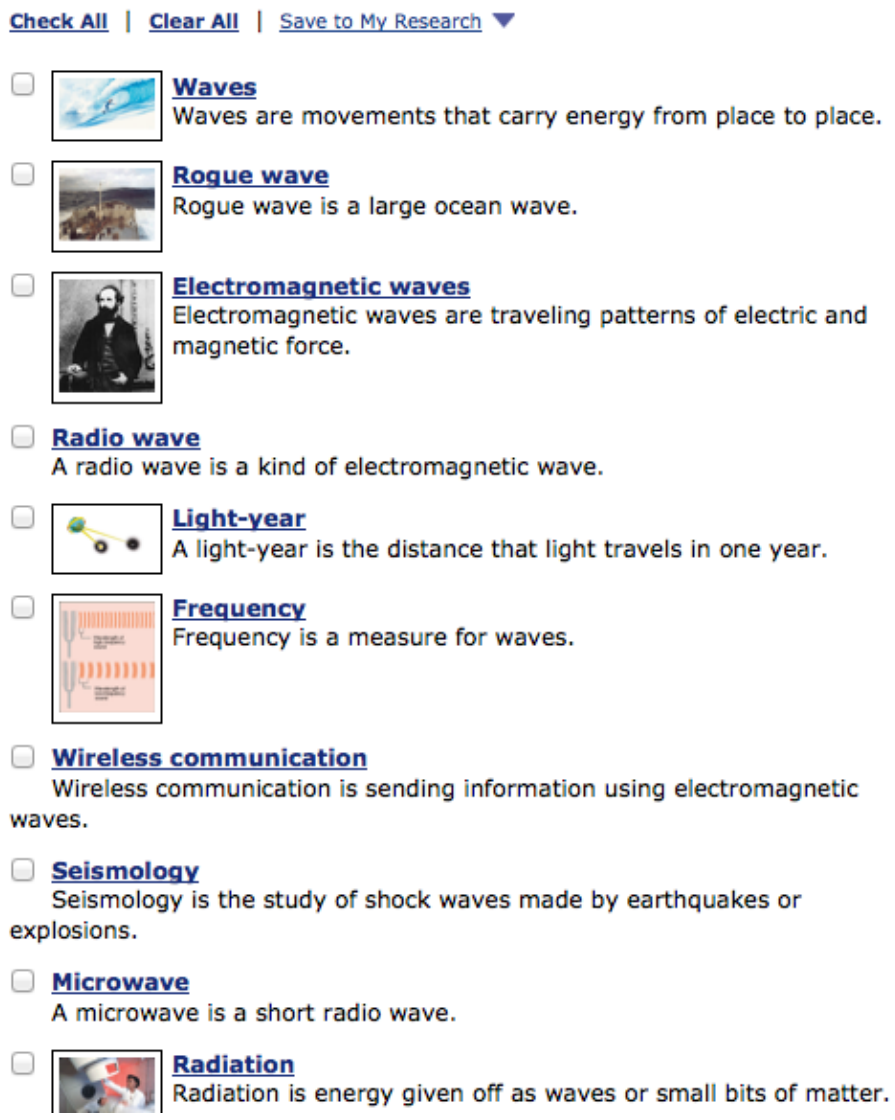


The book that specifically deals with waves is called "Tsunamis." It can be found in the "Earth in Action" section.



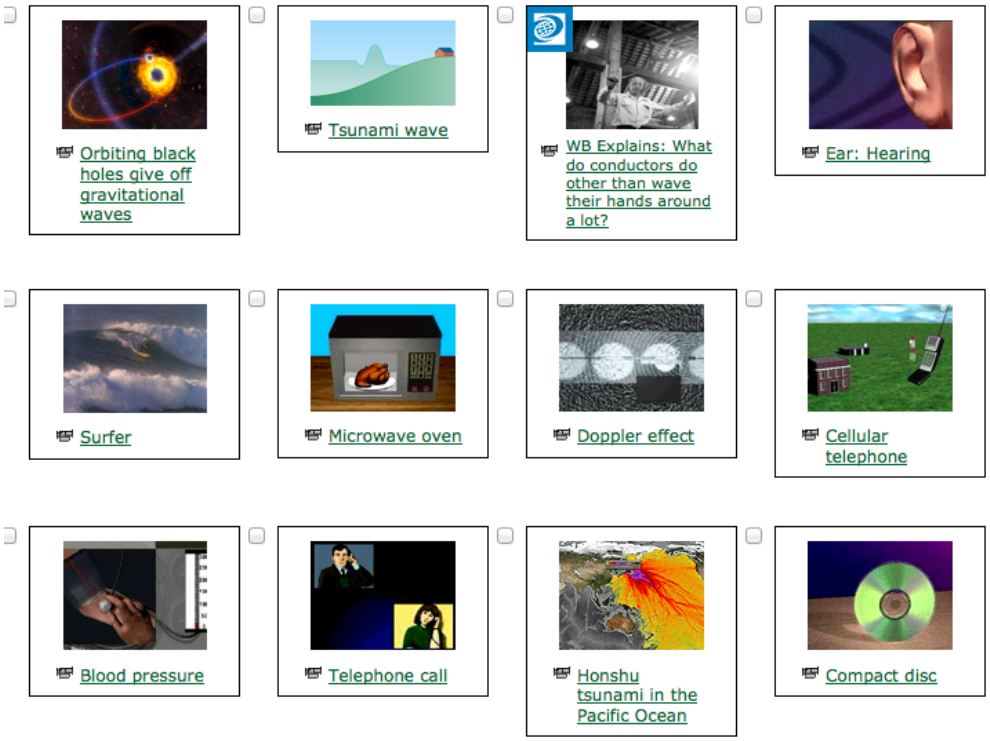
World Book Web:
The World Book Web is a suite of online research tools that includes encyclopedia articles, primary source collections, educator tools, student activities, pictures, audio, and video, complemented by current periodicals and related Web sites. Most all of these World Book Web research tools include options where text can be read aloud to the user. All Ithaca elementary school libraries currently subscribe to ***World Book Kids****,* ***World Book Student****,* ***World Book Discover****,* ***World Book Timelines*** *and* ***World Book Classroom: Early World of Learning****. For specific training in how to use these amazing tools consult Worldbook's training website or ask your school's librarian.* http://www.worldbookonline.com/training/

World Book Discover has many articles which align with Next Generation Science Standards for 4th Grade on waves and their applications. You can simply type "waves" in World Book Discover and choose from the following articles:



This is the main article on waves in World Book Discover:
http://www.worldbookonline.com/wbdiscover/article?id=ar832168&st=waves

World Book Student has 13 videos when you search for the keyword “wave.” All but one of them are applicable to 4th grade Next Generation Science Standards on waves and their applications.



Websites:

Types of Waves
http://scienceprimer.com/types-of-waves
Explores transverse, longitudinal and surface waves.

BBC Bitesize: What are Waves
http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/waves/generalwavesrev1.shtml
Talks about general properties of waves. Includes activity and quiz.

BBC Bitesize: Sound and Light Waves
http://www.bbc.co.uk/schools/gcsebitesize/science/aqa/waves/soundandlightrev1.shtml
Discusses properties of sound and light waves. Includes activity and quiz.

iPad apps:

Waves HD+ - by RC3, INC
Cost: Free
A photographic collection of ocean waves worldwide.

Light Sound HD - by Sprout Labs, LLC
Cost: $1.99
This app covers the topics of light and sound. You can use the read, touch, see, watch, and quiz functions.

PixelWave - by Alexander Zolotov
Cost: $0.99
Use this basic interface to draw waveforms and play with sound waves.