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OBJECTIVES:

1. SWBAT describe the differences between an X-ray machine and an X-ray detector.
2. SWBAT describe, in written form, how each of the machines work.
3. SWBAT compare and contrast the kinds of pictures taken by the RXTE and the Chandra X-ray Observatory.

TIME: 2 days

GRADE: High school physics or TAG (Talented and Gifted) Earth Science

WARM UP:

Start with a brainstorming activity. Ask the students to tell you everything they know about the X-ray machine. Also ask students what they know about X-rays in general. Place all answers on the overhead or chalkboard. Discuss any large misconceptions right away.

BODY:

1. Start by showing the power point presentation “How to See X-rays.” During the presentation, discuss problems, questions, or insights with the students.
2. Split the class up into fifteen groups. Assign each group one of the categories below. Each group is to create a poster with information based on their topic. Each poster is to have a labeled diagram and a description about how the technology in their topic works. Give them one day of in class time to collaborate, then assign it for homework.

The categories:

- Dental X-ray
- CAT scan
- RXTE satellite
- Chandra Satellite
- Baggage X-ray scanners at airports
- X-ray telescope
- X-Ray Crystallography
- CT or Computed Tomography scan
- Magnetic Resonance Imaging (MRI)
- Ultrasonography
- PET or Positron-Emission Tomography Scan
- panorex (rotating X-ray of the jaws)
- barium swallow (series of x-rays performed while the patient swallows a barium-containing liquid that is visible on the x-ray),
- radionuclide bone X-ray
- as a treatment for cancer

3. On the day the posters are due, each group can spend two minutes discussing their poster. The posters are to be placed on the wall, and students are to be given time to read the posters at the beginning or end of class for the rest of the week. The teacher may choose to give a quiz or other assessment based on the posters.

CLOSURE:

Discuss any questions or problems associated with the posters or the information on the posters.