CONCEPT: MEASURING RADIOACTIVITY

● Radiation can be measured in several different ways depending on which _____ is being measured.

Units of Radiation Measurement

Common Unit	SI Unit	Property Measured
Curie (Ci) ▫ 1 Ci = _____ disintegration(s)/sec	**Becquerel (Bq)** ▫ 1 Bq = __ disintegration(s)/sec	Activity: _____ events
Roentgen (R) ▫ 1 R = _____ charges/cm^3		Exposure: ionizing intensity of ___ or ___ rays
Rad ▫ 1 Rad = _____ J/g ▫ 1 Rad = 1 R	**Gray (Gy)** ▫ 1 Gy = __ J/kg ▫ 1 Gy = ___ Rad	Energy absorbed by _____
Rem ▫ Rems = rads x _____	**Sievert (Sv)** ▫ 1 Sv = ____ Rem	Tissue _____

□ **Relative Biological Effectiveness (RBE):** factor accounts for both _____ intensity and _____ effect.

- X rays, γ rays, ß particles: RBE = 1 - α particles: RBE = 20

EXAMPLE: The initial responders to the Chernobyl nuclear disaster were exposed to 23 Sv of radiation. Convert this value to rem.

PRACTICE: A typical chest X-ray exposes a patient to an effective dose of 0.09 mSv. How many Rad is this?

CONCEPT: MEASURING RADIOACTIVITY

PRACTICE: Two technicians in a nuclear laboratory were accidentally exposed to radiation. If one was exposed to 5 mGy and the other to 9 rad, which technician received more radiation?

PRACTICE: A solution of iodine-131, a radioisotope used in the diagnosis and treatment of thyroid disease, is found just prior to administration to have an activity of 1.08×10^6 Bq/mL. If 2.57 mL were delivered intravenously to the patient, what dose of I-131 (in μCi) did the patient receive?