THE STANDARD

# Distance & Potential Energy

*Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.*

## DCI — DISCIPLINARY CORE IDEA

### PS3.A · Definitions of Energy

> *A system of objects may also contain stored (potential) energy, depending on their relative positions.*

Energy doesn't only live in motion. When two objects pull or push on each other across a distance, the system stores energy in their arrangement. Lift a ball higher above Earth and you store more gravitational potential energy. Push two like-pole magnets closer and you store more magnetic potential energy. **Change the arrangement, change the stored energy.**

## SEP — SCIENCE & ENGINEERING PRACTICE

### Developing and Using Models

> *Develop a model to describe unobservable mechanisms.*

Students build models to show something they can't see: stored energy. The model can be a drawing, a diagram, a labeled photo, or a written description. **What makes it count as a model is that it shows the two objects, the distance between them, and how the stored energy changes when that distance changes.**

## CCC — CROSSCUTTING CONCEPT

### Systems and System Models

> *Models can be used to represent systems and their interactions, such as inputs, processes, and outputs, and energy and matter flows within systems.*

The energy isn't in the ball. It's in the ball-and-Earth system. That shift, from "the object has energy" to "the system stores energy in the arrangement," is the whole point. **Students stop tracking single objects and start tracking pairs and the space between them.**