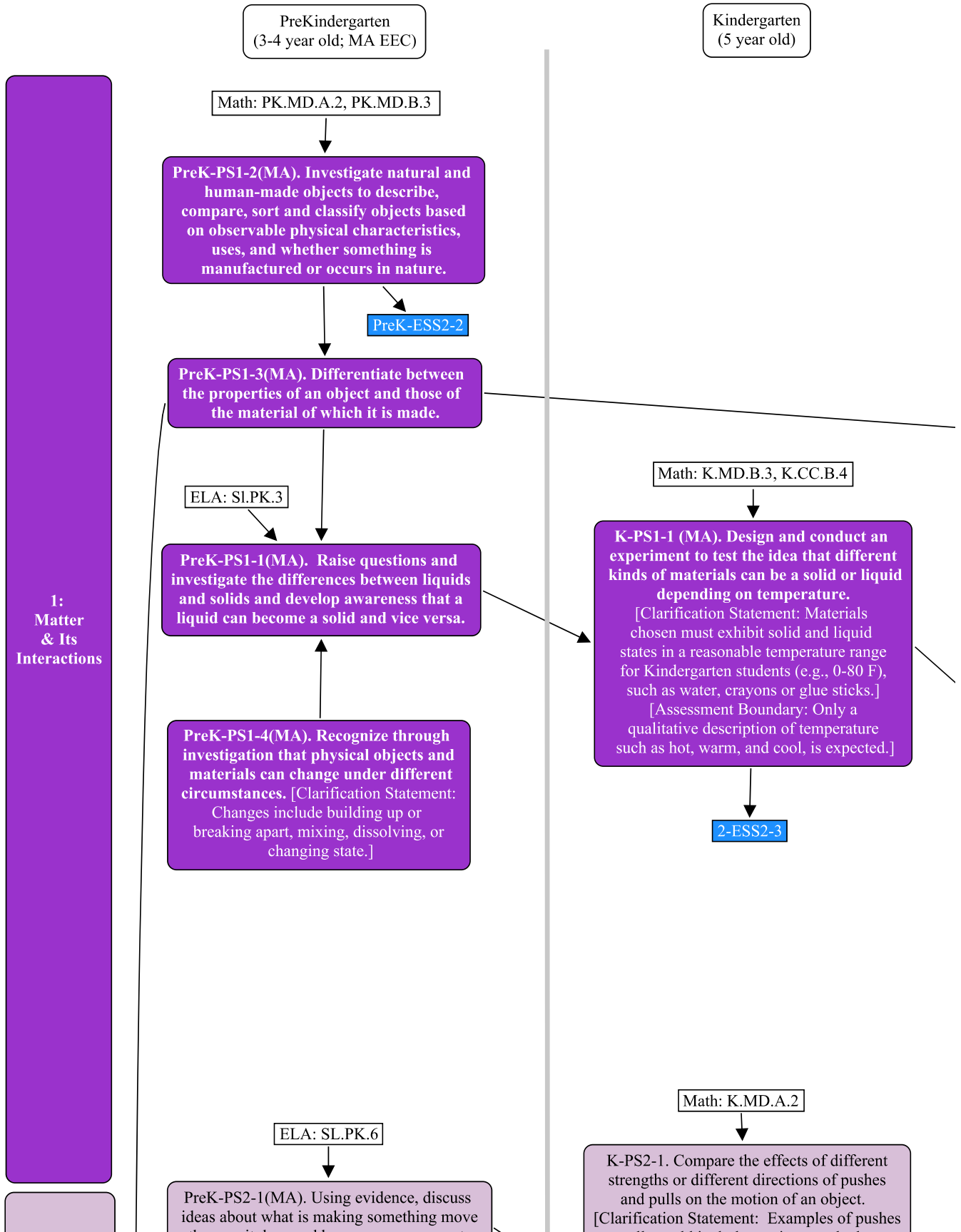
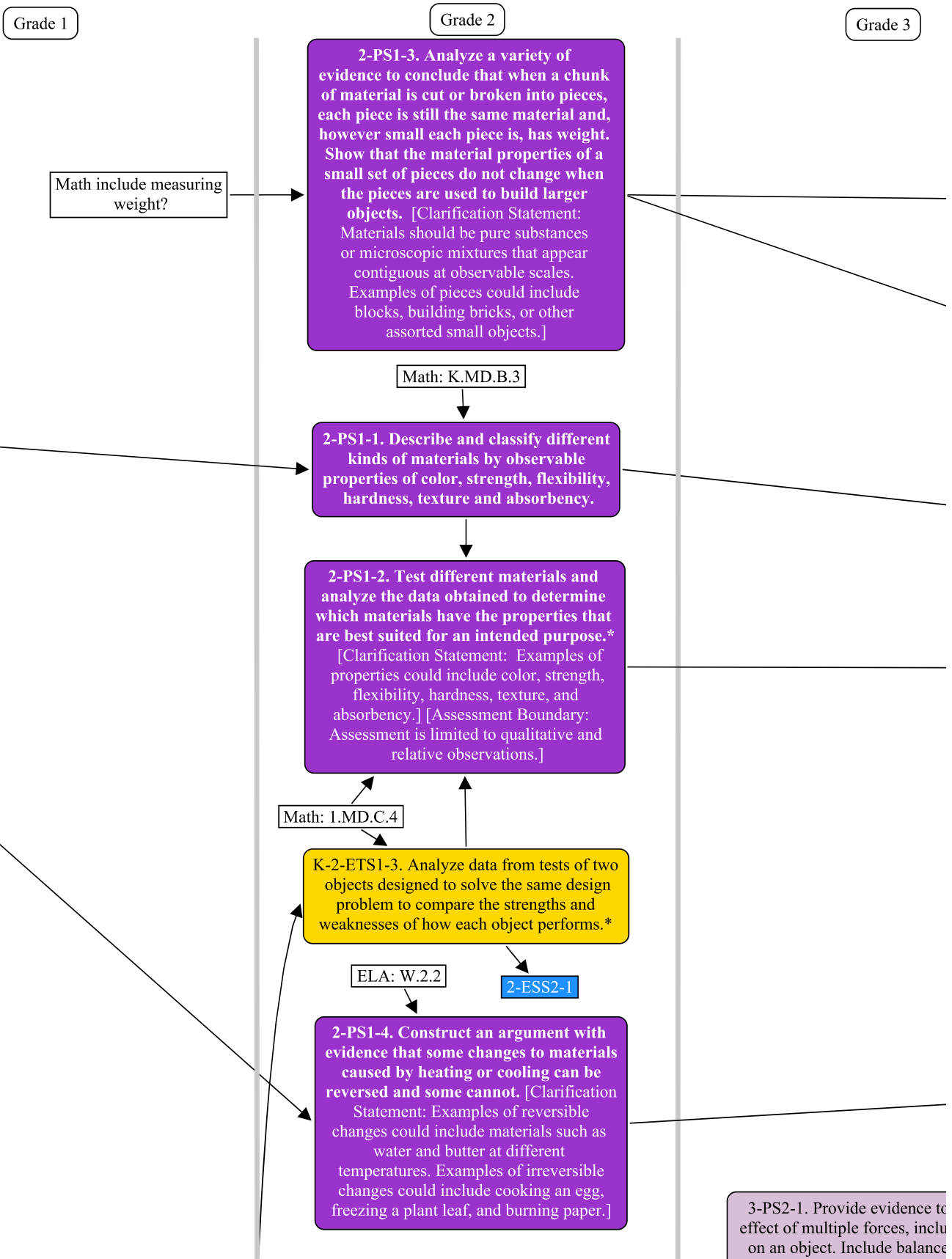


MA Draft Revised PreK-5

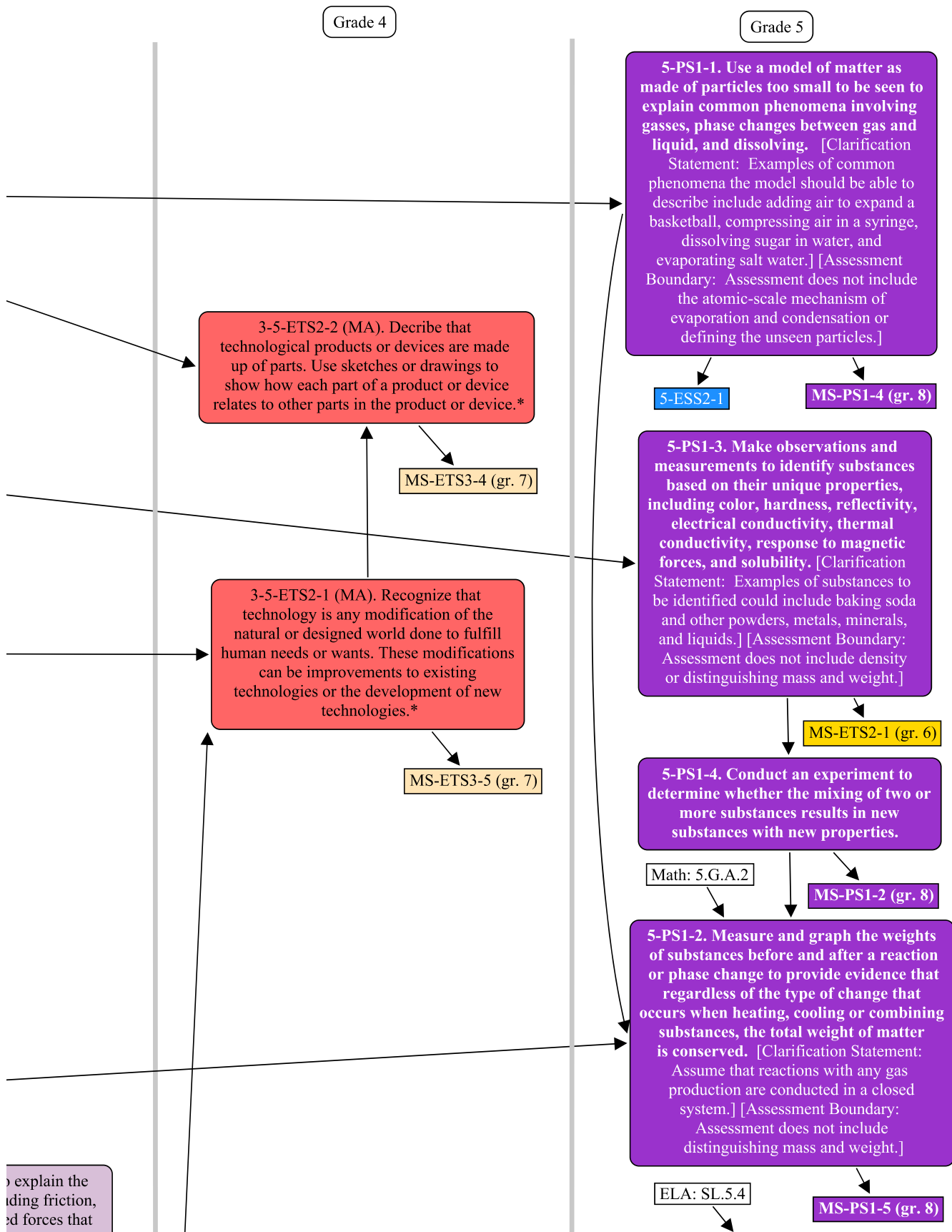


Physical Science and Technology/Engineering

Based on *A Framework for K-12 Science Education* (NRC, 2012) and adapted from the *Next Generation Science Standards* (2013)
Please direct comments, suggested edits, and questions to: mathsciencetech@doe.mass.edu.
The standards and strand maps are available at: www.doe.mass.edu/stem/review.html
(*) denotes integration of technology/engineering through a practice or core idea.



g Strand Map (12/20/13)



2:
Motion
and
Stability:
Forces
and
Interactions

the way it does and how some movements can be controlled.

PreK-PS2-2(MA). Through experience, develop awareness of factors that influence whether things stand or fall. [Clarification Statement: Examples of factors in children's construction play include using a broad foundation when building, considering the strength of materials, and using balanced weight distribution in a block building.]

or pulls could include a string attached to an object being pulled, a person pushing an object, a person stopping a rolling ball, and two objects colliding and pushing on each other.] [Assessment Boundary: Assessment is limited to different relative strengths or different directions, but not both at the same time. Assessment does not include non-contact pushes or pulls such as those produced by magnets.]

3:
Energy

K-PS3-1. Make observations to determine that sunlight warms materials on Earth's surface. [Clarification Statement: Examples of materials on Earth's surface could include sand, soil, rocks, and water] [Assessment Boundary: Assessment of temperature is limited to relative measures such as warmer/cooler.]

K-PS3-2. Use tools and materials to design and build a prototype of a structure that will reduce the warming effect of sunlight

do not change the motion of t
unbalanced forces that do char
of the object. [Assessment
Assessment is limited to one
time: number, size, or direct
Assessment does not include
force magnitude, only qual
relative. All descriptions of
limited to a force that pulls of

MS-PS2-2 (gr. 8

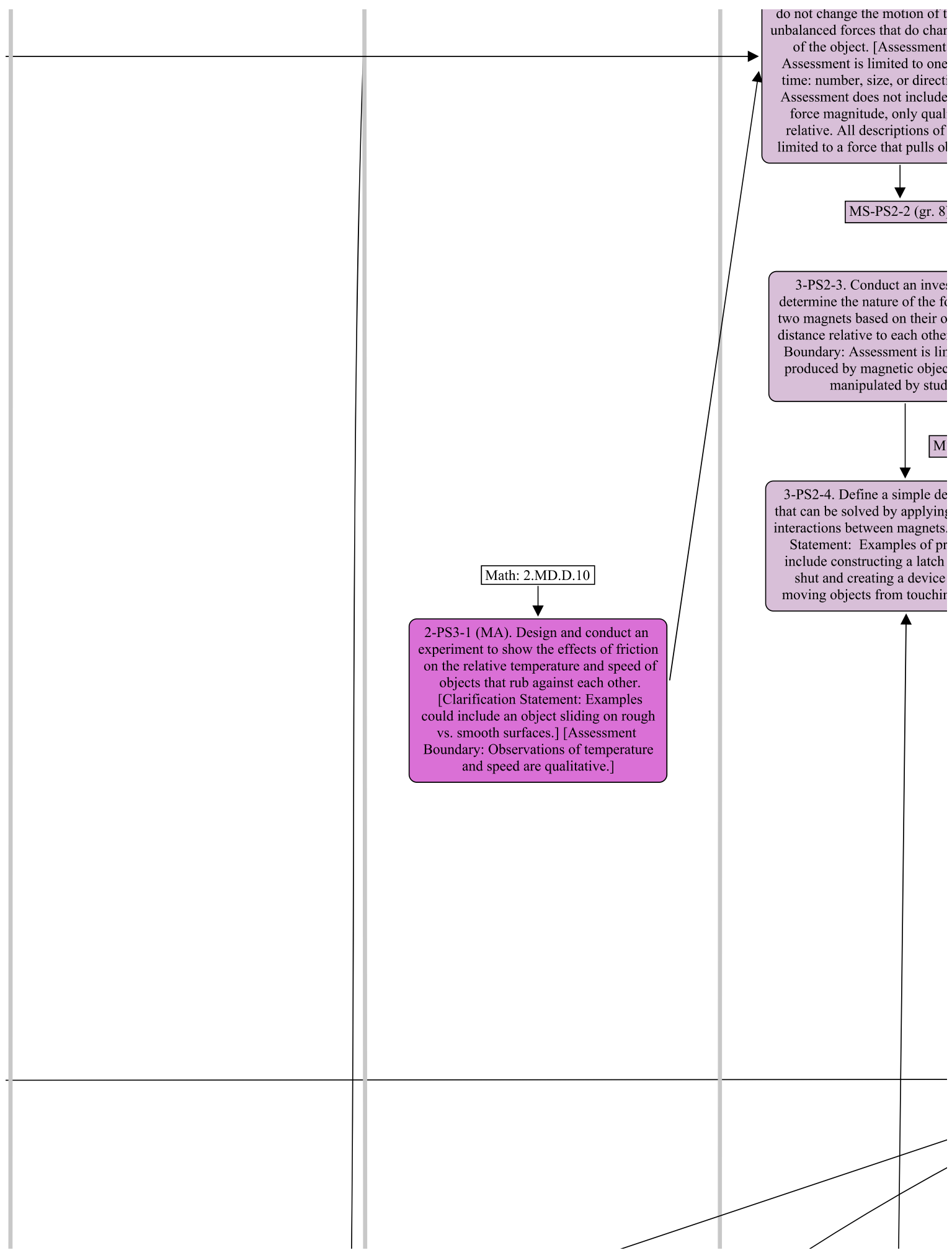
3-PS2-3. Conduct an inve:
determine the nature of the fo
two magnets based on their o
distance relative to each othe
Boundary: Assessment is lir
produced by magnetic objec
manipulated by stud

M

3-PS2-4. Define a simple de
that can be solved by applying
interactions between magnets.
Statement: Examples of pr
include constructing a latch
shut and creating a device
moving objects from touchir

Math: 2.MD.D.10

2-PS3-1 (MA). Design and conduct an
experiment to show the effects of friction
on the relative temperature and speed of
objects that rub against each other.
[Clarification Statement: Examples
could include an object sliding on rough
vs. smooth surfaces.] [Assessment
Boundary: Observations of temperature
and speed are qualitative.]



the object and
change the motion
Boundary:
variable at a
tion of forces.
quantitative
itative and
gravity are
objects down.]

)

stigation to
forces between
orientation and
r. [Assessment
nited to forces
ts that can be
ents.]

S-PS2-3 (gr. 7)

esign problem
g the use of the
* [Clarification
blems could
to keep a door
to keep two
g each other.]

5-PS2-1. Support an argument with evidence that the gravitational force exerted by Earth on objects is directed toward the Earth's center. [Assessment Boundary: Assessment does not include mathematical representation of gravitational force.]

MS-PS2-4 (gr. 6)

MS-ESS2-4 (gr. 7)

ELA: SL.4.3, W.4.8

4-PS3-1. Use evidence to construct an explanation relating the speed of an object to the energy of that object. [Assessment Boundary: Assessment does not include quantitative measures of changes in the speed of an object or on any precise or quantitative definition of energy, nor account for mass.]

MS-PS3-1 (gr. 7)

MS-PS3-5 (gr. 7)

4-PS3-3. Ask questions and predict outcomes about the changes in energy that occur when objects collide. [Clarification Statement: Changes in energy can include a change in the object's motion, position, and the generation of heat and/or sound.] [Assessment Boundary: Assessment does not include analysis of forces or quantitative measurements of energy.]

4-PS3-2. Make observations to show that energy can be transferred from place to place by sound, light, heat, and electric currents. [Assessment Boundary: Assessment does not include quantitative measurements of energy.]

4-ESS3-1

5-LS1.1

MS-ESS2-4 (gr. 7)

MS-PS3-6 (MA) (gr. 7)

4-PS3-4. Apply scientific principles of energy and motion to test and refine

5-LS2-1

5-PS3-1. Use a model to describe that the food animals digest: a. contains energy that was once energy from the sun, and b. provides energy and materials for body repair, growth, motion, body warmth, and reproduction. [Clarification Statement: Examples of models could include diagrams and flow charts.] [Assessment Boundary: Details



on an area.*

4:
Waves

PreK-PS4-2(MA). Connect daily experience and investigations to demonstrate the relationships between the size and shape of shadows, the objects creating the shadow, and the light source.

PreK-PS4-1(MA). Investigate sounds made by different objects and materials and discuss explanations about what is causing the sounds. Through play and investigations, identify ways to manipulate different objects and materials that make sound to change volume and pitch.

