Name _____

Date _____

Test 1-2 A: Interactions & Force Diagrams

- **READ EACH QUESTION carefully – show all calculations and relevant diagrams.**
- **Label all force values that can be found, and use congruency marks as needed.**
- **For each "CONNECT" symbol, write the page number of the notebook where that skill description or notes section appears.**

★ Assume that air can be ignored in every situation.

1. The mass of a **block** is 1.2 kg. **Calculate the force exerted by Earth on the block.**

HINT: ALWAYS write the general equation first, then substitute, then solve.

CONNECT
Skill 3d, p __
Skill 2d, p __
BFM 6, p __

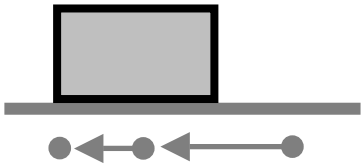
The block *slows down* as it slides on the floor, due to a 6N friction interaction.

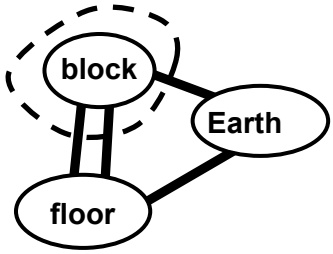
HINT: We label friction interactions as: F__On__ (friction)

c. force diagram **with values**
cong. marks? yes no

b. system diagram

CONNECT
Skill 3c, p __
BFM 4, p __
BFM 5, p __





block

2. A person stands on a **ladder** *at rest*, exerting a force of 650N down. The Earth exerts 320N down on the **ladder**, and the ground exerts 970N.

a. system diagram

b. force diagram **with values**
cong. marks? yes no

CONNECT
Skill 3c
BFM 4
BFM 5

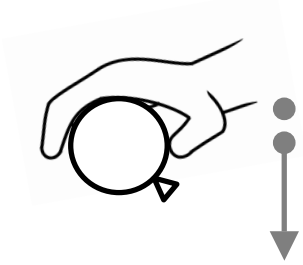
c. **Calculate the mass of the ladder.** ($F_{EarthOnLadder}$ = 320N)

ladder

CONNECT
Skill 3d
Skill 2d
BFM 6

3. A person throws a water **balloon** down from a roof, and the **balloon** *increases speed downward*.

a. system diagram



b. force diagram
cong. marks? yes no

● balloon

3c I can use evidence about motion to determine whether the forces on an object are balanced, and show balanced forces on a force diagram with congruency marks.

Inspiring: MM	Solid: M	Improving: P	Struggling: X
My force arrow lengths suggest the strength of each force.	I use congruency marks to show **balanced force whenever motion is constant.**	I connected constant motion to balanced force, but **made a few mistakes with congruency marks**.	My work didn't connect constant motion to balanced force, or I **didn't use congruency marks**.

3d I know the difference between force and mass, and can make calculations involving the force exerted by the Earth on an object that has mass.

Solid: M	Improving: P	Struggling: X
I **substituted mass or FEonO into a general equation** to solve for the unknown value.	I calculated FEonO from mass, but **not the other way around**.	I **treated force and mass as the same thing**, or I used 10N/kg to calculate a force other than FEonO.

2d I use algebra correctly when solving problems, first writing a general form, then substituting specific values.

Solid: M	Improving: P	Struggling: X
I write the **general equation first,** subsitute, then solve.	I **used the wrong general equation**, **substituted wrong** or **made small errors** in my algebra steps.	My algebra contained major errors, or I **didn't show a general equation** at all.

New Skills: Look at your feedback (M, P, or X) for each skill, and read the rubric description that connects to the feedback on your work.

☐ **3c** I can use evidence about motion to determine whether the forces on an object are balanced, and show balanced forces on a force diagram with congruency marks.

☐ **3d** I know the difference between force and mass, and can make calculations involving the force exerted by the Earth on an object that has mass.

☐ **2d** I use algebra correctly when solving problems, first writing a general form, then substituting specific values.

Older Skills: These older skills are also important on this test.

☐ **3a** Identify interactions

☐ **2a** Check Multiple Representations

☐ **3b** Draw Force Diagrams

☐ **S-N** Use notes