Newton's Laws Practice   Name:_____

Reflection and Self-Assessment

Part 1: Circle the statement that best describes how you completed the practice:
- I answered all questions without using the online solutions. I checked my answers against the key at the back of the practice and was able to determine my mistakes and correct them without referring to the online solutions.

- I answered most questions correctly without using the online solutions. I used the online solutions to help me with some questions and was able, with help from the online solutions, to understand every question and answer them correctly.

- I used the online solutions to help me with most of the questions. I was able, with help from the online solutions, to understand each question and answer them correctly.

- Even using the online solutions, I was not able to fully understand the solution to some problems. The questions I had trouble with were:

    _____

- I did not attempt all the questions on the practice.

Part 2: Circle the statement that best describes your confidence in answering questions of this type in the future.
- I am confident I can answer nearly any question of this type correctly without using notes or other assistance.

- I am confident I can answer **MOST** questions of this type correctly without using notes or other assistance.

- I am **NOT** confident I can answer most questions of this type correctly without using notes or other assistance.

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1. The Greek philosopher Aristotle believed that objects with no net force acting on them would not move. What is incorrect about this?

2. What is the net force on an object being pulled East by a 55 N force and to the West by a 67N force? Draw a FBD of this situation.

3. The force of gravity on a book at rest on a table is 43 N down. What is the magnitude and direction of the normal force acting on the book? Draw a FBD of this situation.

4. Given the FBDs shown determine the net force acting on the object (magnitude and direction), and if the object will be accelerating or not.
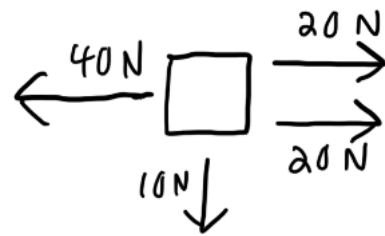
a)

20 N ←—☐—→ 20 N

b)

20 N ←—☐———→ 40 N

c)

↑20 N
☐——60 N→
↓20N

d)

40 N ←—☐—→ 20 N
10N↓   20 N→
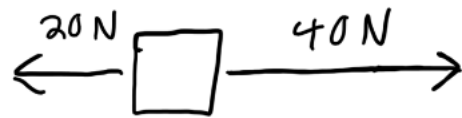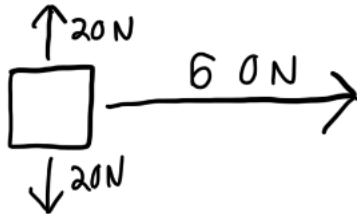
5. The net force acting on an object is zero, circle **ALL** of the following which are **possible**:

A: The object is moving at 3 m/s to the left.

B: The object is moving at 9 m/s to the right.

C: The object is stationary.

D: The object is accelerating at 3 m/s^2 to the left.

E: The object is accelerating at 9 m/s^2 to the right.

F: There are no forces acting on the object

G: The is a single force acting on the object.

H: There are several forces acting on the object.

6. A ball is rolling across the floor, slowing to a stop. Which of the following is why it is slowing?
No force is acting on it.

OR

A force is acting on it in the opposite direction of its movement.

7. One person pushes a 45 kg block to the left with a force of 56 N. Another person pushes the block to the right. The net force acting on the block is 12 N to the left. How much force is the person pushing to the right applying?

8. One person pushes a 45 kg block to the left with a force of 56 N. Another person pushes the block to the right. The net force acting on the block is 36 N to the right. How much force is the person pushing to the right applying?

9. A net force of 100 N acts on an object causing it to accelerate. How would the acceleration of the object change (i.e. will it be twice as much, half as much, a quarter as much) if:

   a. The net force was 200 N rather than 100 N.

   b. The net force was 50 N rather than 100 N.

   c. The mass of the object was doubled.

   d. The mass of the object was halved.

10. Someone pushes a truck in neutral causing it to accelerate, they then push a kid's wagon with the same force. Which object, the truck or the wagon will accelerate more? Why?

11. A net force of 250 N is applied to a 23 kg object, what will its acceleration be?

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12. A 2.5 kg mass accelerates at 2.1 m/s^2. What is the net force acting on it?

13. An 874 N net force causes an object to accelerate at 2.5 m/s^2. What is the mass of the object?

14. A 2.5 kg object has a net force of 25 N acting on it. What is its acceleration?

15. A 6.2 kg object has a net force of 5.6 N acting on it. What is its acceleration?

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    16. What net force is needed to accelerate a 3.2 kg object at 4.2 m/s^2?

    17. What net force is needed to accelerate a 15.2 kg object at 4.2 m/s^2?

    18. What is the mass of an object if a 56 N net force accelerates it at 28 m/s^2?

    19. What is the mass of an object if a 250 N net force accelerates it at 5.0 m/s^2?

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20. One person pushes a 25 kg block to the left with a force of 36 N, another person pushes the block to the right with a force of 93 N.

    a.   What is the net force acting on the block?

    b.   What is the acceleration of the block?

21. One person pushes a 45 kg block to the left with a force of 56 N. Another person pushes the block to the right. The block accelerates at 0.30 m/s^2 to the left.

    a.   What is the net force acting on the block?

    b.   How much force is the person pushing to the right applying?

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22. Draw a Free Body Diagram for the block and the person with all forces acting on them labelled.

Situation: *A person attempts to pull a heavy block along a floor with a rope, but the block does not move.*	Interaction Diagram
FBD: *Block*	**FBD:** *Person*
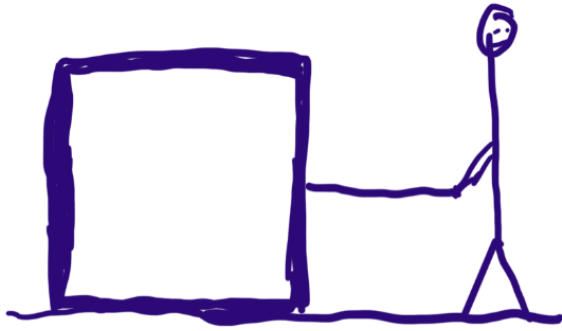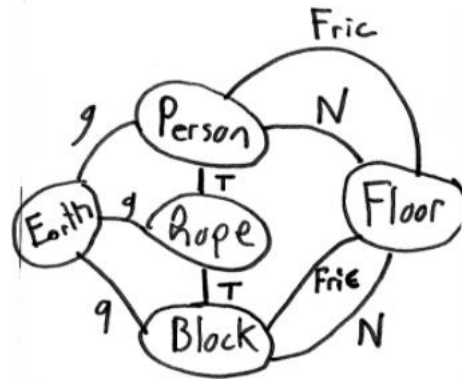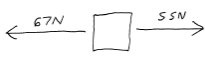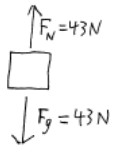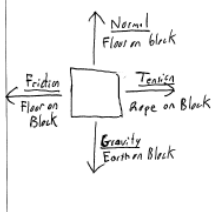
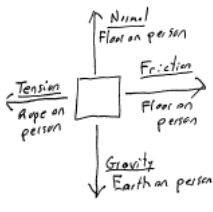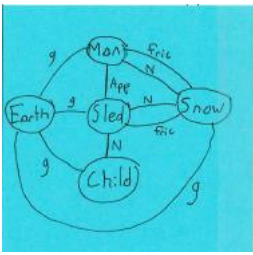Newton's Laws Practice   Name:_____
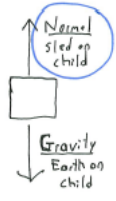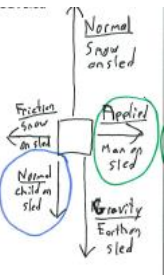
23. Draw an interaction diagram of the forces, then draw free body diagrams for the child, the sled and the man. Circle the two sets of Newton's Third Law force pairs.

Situation: *A man pushes a child sitting on a sled at a constant velocity through the snow.*	Interaction Diagram

FBD: Child	FBD: *Sled*	FBD: *Man*

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1) No net force can mean stationary OR constant velocity.	2) F_{net} = 12 N West	3) F_N = 43 N upwards	4a) $F_{net} = 0$ Not accelerating	4b) F_{net} =20 N right Accelerating to the right
4c) F_{net} = 60 N right Accelerating to the right	4d) F_{net} = 10 N down Accelerating to the downwards	5) A, B, C, F, H	6) A force is acting on it	7)44 N
8)92 N	9a) Acceleration doubles	9b) Acceleration halved	9c) Acceleration halved	9d) Acceleration doubled
10) Wagon, because it has less mass	11)11 m/s²	12) 5.3 N	13) 350 kg	14) 0.90 m/s²
16) 13 N	17) 64 N	18)2.0 kg	19) 5.0×10^1kg	20a)57 N to the right
20b) 2.3 m/s² right	21a)14 N left	21b) 42 N	22a)	22b)
23: Interaction Diagram	23: Child	23: Sled	23: Man	