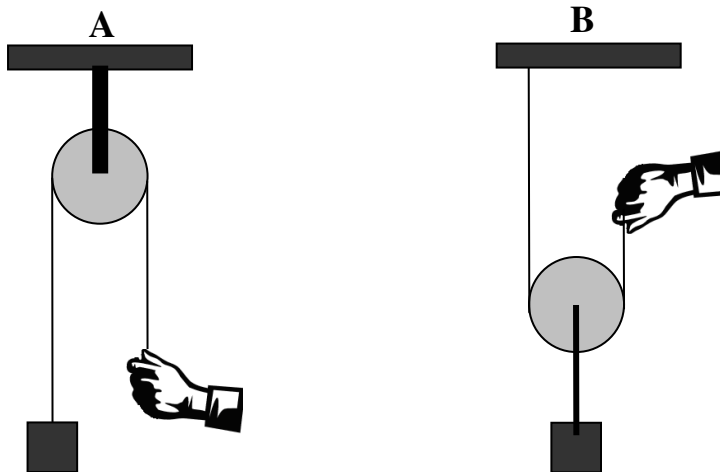Name: _____   Date: _____

Pulleys Test

Instructions: Circle only *one* letter to indicate your answer for each question.

Q1) If we ignore friction, which of the following two pulleys systems will require *less effort* (force) to lift the load?

A   B

A.) Pulley A

B.) Pulley B

C.) Both Pulley A & Pulley B will require the same effort (force)

D.) Not enough information to decide

Q2) If we ignore friction, which will require *less effort* (force) to lift a box to a height of 1 meter – using the pulley system shown or lifting the box straight up?
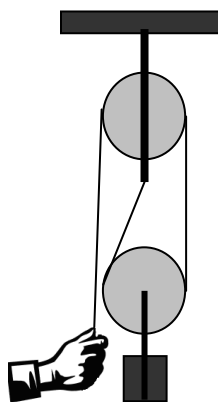
A.) Using the pulley system

B.) Lifting it straight up

C.) Both using the pulley system or lifting it straight up require the same effort (force)

D.) Not enough information to decide

1

Q3) You use a fixed pulley to lift a watermelon to your tree house. If you changed it to a movable pulley and ignore the effects of friction:

    3a) the *distance* pulled would:

        A.) Increase

        B.) Decrease

        C.) Stay the same

        D.) Not enough information to decide

    3b) Explain your reasoning about the *distance* pulled.

Q4) You use a fixed pulley to lift a watermelon to your tree house. If you changed it to a movable pulley and ignore the effects of friction:
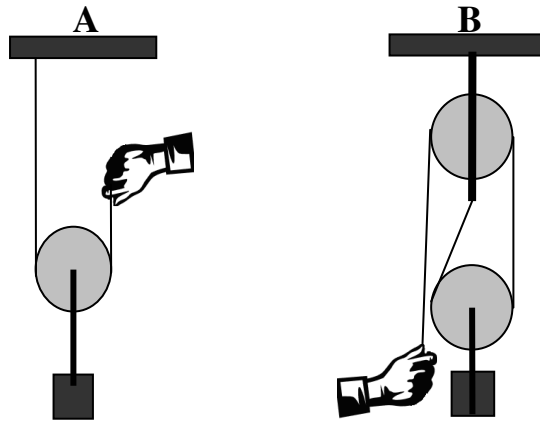
    Q4a) the *effort* (force) required would:

        A.) Increase

        B.) Decrease

        C.) Stay the same

        D.) Not enough information to decide

    Q4b) Explain your reasoning about the *effort* (force) required.

Q5) Which of the following will require *less effort* (force) to lift a load to a height of 2 m using a single fixed pulley?

        A.) A well-oiled pulley

        B.) A pulley that sticks (needs to be oiled)

        C.) Both pulleys will require the same effort (force)

        D.) Not enough information to decide

Q6) If we ignore friction, which of the following pulley systems will require *less effort* (force) to lift the load?

A   **B**

A.) Pulley System A

B.) Pulley System B

C.) Both A and B will require the same effort (force)

D.) Not enough information to decide

Q7) If we ignore friction, which one of the following pulley systems will require *less effort* (force) to lift a load?

A.) One fixed pulley

B.) Two fixed pulleys

C.) One movable pulley

D.) A double compound pulley

Q8) You used a single fixed pulley to lift a watermelon to your tree house. If you used a single movable pulley instead and ignore the effects of friction:

Q8a-1) the *effort* (force) needed would:

    A.) Increase

    B.) Decrease

    C.) stay the same

    D.) not enough information to decide
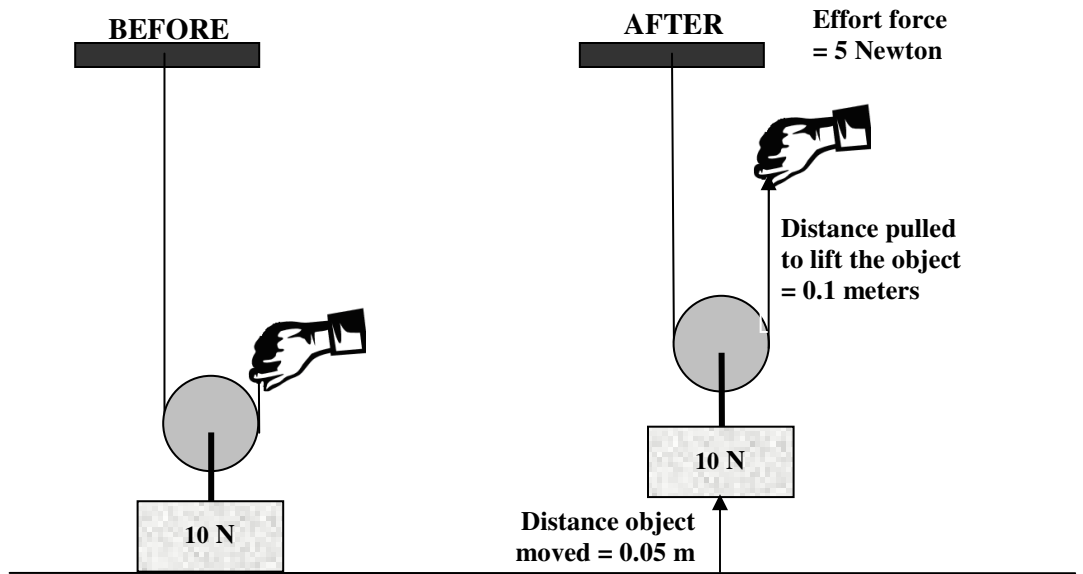

Q8a-2) Explain your reasoning about the *effort* (force) needed.

Q8b-1) the *work* done would:

    E.) Increase

    F.) Decrease

    G.) stay the same
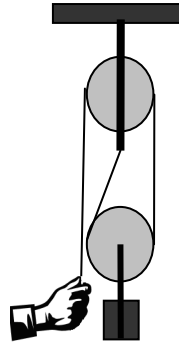
    H.) not enough information to decide

Q8b-2) Explain your reasoning about the *work* done.

Q9) Below are before and after pictures of a load being lifted with the help of a pulley. Ignoring friction, find calculate the *work* done using the information from the picture below:

BEFORE   **AFTER**   **Effort force
                                                  = 5 Newton**

**Distance pulled
to lift the object
= 0.1 meters**

10 N

**Distance object
moved = 0.05 m**

10 N

Clearly show how you arrive at your answer

Q10) Jane is lifting a box straight up to a height of 1 m. Mary is using the pulley system shown below to lift the same box to the same height. If we ignore friction, what can you tell about the *work* done by Jane and Mary?
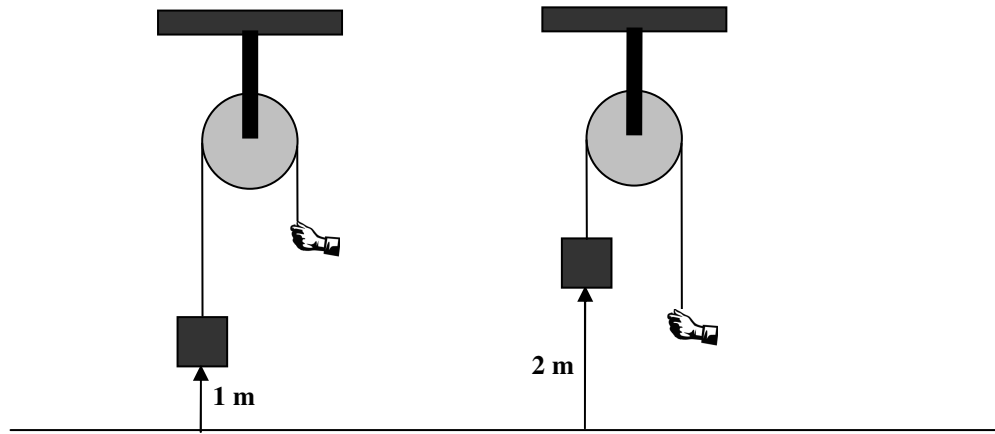
A.) Jane is doing more work

B.) Mary is doing more work

C.) Jane and Mary are doing the same work

D.) Not enough information to decide

Q10a) Explain your reasoning about *work* done in this question.

Q11) Which of the following will require more *work* to lift a load to a height of 2 m if you are using a single fixed pulley?

A.) A well-oiled pulley

B.) A pulley that sticks (needs to be oiled)

C.) Both pulleys will require the same work

D.) Not enough information to decide

Q12) Jacob is using a fixed pulley to separately lift two boxes of the same size and mass up to two different heights. He lifts one box 1 meter and then lifts the second box 2 meters above the ground. Ignoring friction, when lifting the box 2 meters, Jacob is doing _____ *work* as/than when lifting the first box 1 meter high?

6

2 m

1 m

A.) More

B.) Less

C.) Same amount of

D.) Not enough information to decide

Q12a) Explain your reasoning about *work* done in this question.

Q13) Amy is using pulley system A, Bob is using B, and Cathy is using C. What can you tell about the *work* needed to lift the same load to the same height by each of them, if we ignore friction?

A
B
C
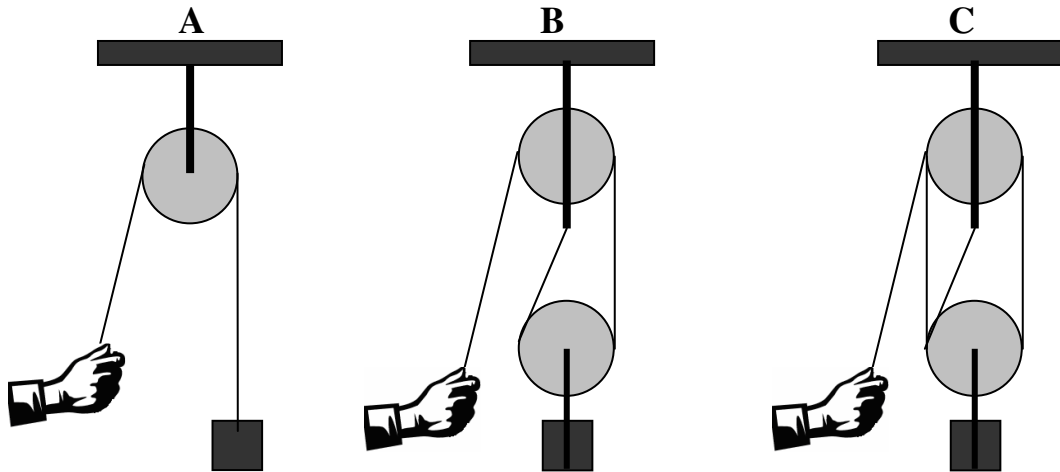
A.) Amy (using pulley system A) is doing more work

B.) Bob (using pulley system B) is doing more work

C.) Cathy (using pulley system C) is doing more work

D.) The work done in all three situations is the same

Q14) If we ignore friction, which one of the following pulley systems will give more *mechanical advantage*?

A.) One fixed pulley

B.) Two fixed pulleys

C.) One movable pulley

D.) A double compound pulley

Q14a) Explain your reasoning about *mechanical advantage* in this question.

Q15) If we ignore friction, which one of the following pulley systems will give more *mechanical advantage*?

A   **B**
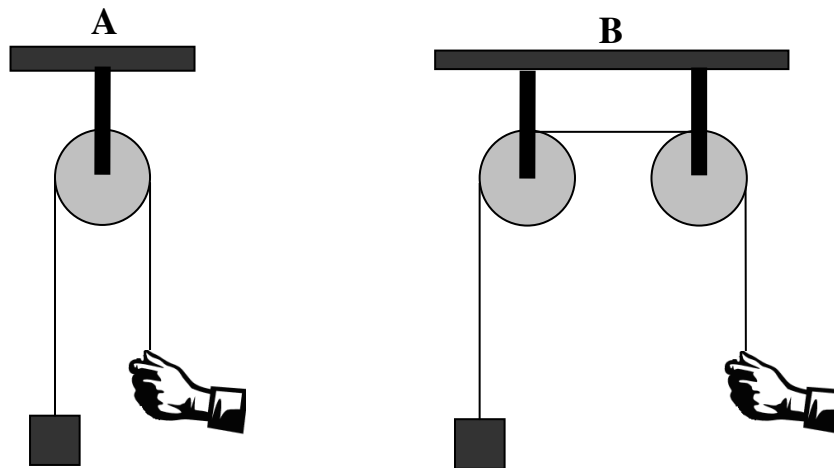
A.) Pulley System A

B.) Pulley System B

C.) Pulley System A and Pulley System B will give you the same mechanical advantage
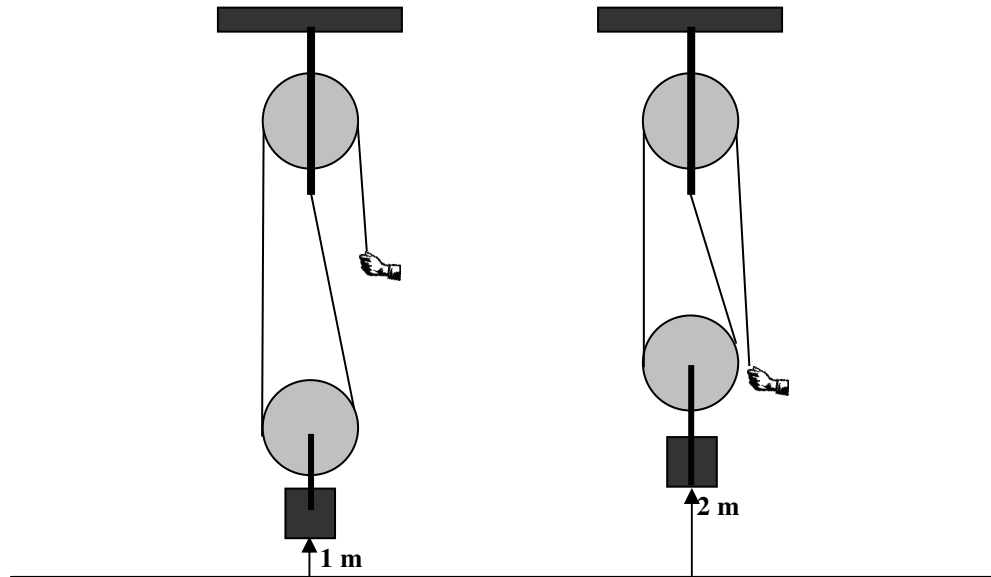
D.) Not enough information

Q15a) Explain your reasoning about *mechanical advantage* in this question.

Q16) If we ignore friction, which one of the following pulley Systems will give more
*mechanical advantage*?

A   **B**
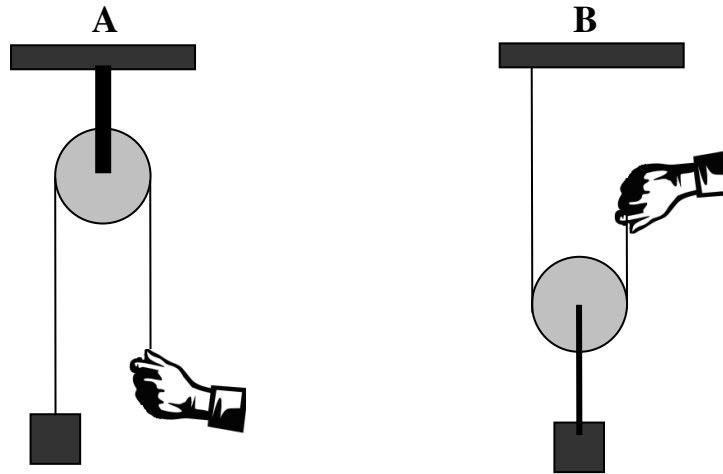
A.) Pulley System A

B.) Pulley System B

C.) Pulley System A and Pulley System B will give you the same mechanical advantage

D.) Not enough information

Q17) Yi uses a single compound pulley to lift a box 1 m. He then uses the same pulley system to
lift an identical box 2 m. Which box undergoes a greater change in *potential energy*?

2 m

1 m

A.) The box lifted 1 m

B.) The box lifted 2 m

C.) Both boxes have the same change in potential energy

D.) Not enough information to decide

Q18) Louis lifts a box 1 m using Pulley System A. Toby lifts an identical box to the same height using Pulley System B. Which box undergoes a *greater change in potential energy*?
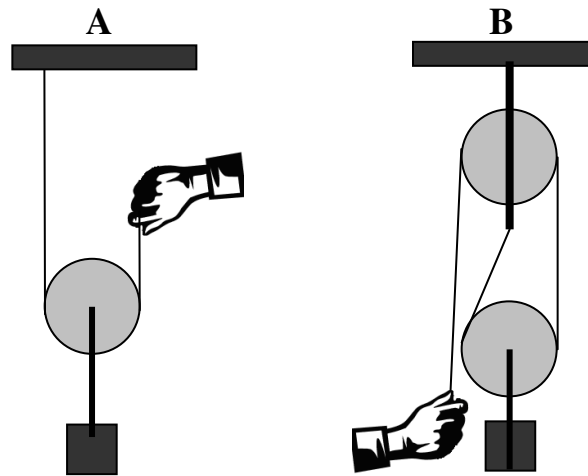
A.) The box on Pulley System A

B.) The box on Pulley System B

C.) Both boxes have the same change in potential energy

D.) Not enough information to decide

Q19) Henry uses a well-oiled double compound pulley to lift a box 1 m. If you **can** ignore friction, how does the work to lift the box compare to the box's change in potential energy while being lifted?

A.) The work needed is greater than the change in potential energy

B.) The work needed is less than the change in potential energy

C.) The work needed is the same as the change in potential energy

D.) Not enough information to decide

Q20) Gloria uses a squeaky (needs to be oiled) double compound pulley to lift a box 1 m. If you **cannot** ignore friction, how does the work to lift the box compare to the box's change in potential energy while being lifted?

A.) The work needed is greater than the change in potential energy

B.) The work needed is less than the change in potential energy

C.) The work needed is the same as the change in potential energy

D.) Not enough information to decide