Name_____

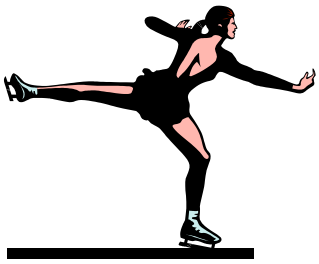
Date _____ Pd____

## Forces Unit 3:
# Force Diagrams

In each of the following situations, represent the object with a particle. Sketch all the forces acting upon the object, making the length of each vector represent the magnitude of the force. Also use congruency marks to indicate which vectors are equal in magnitude.

1. Draw a force diagram for the motionless cat on a rug. Label the forces and use equality marks on the force vectors.

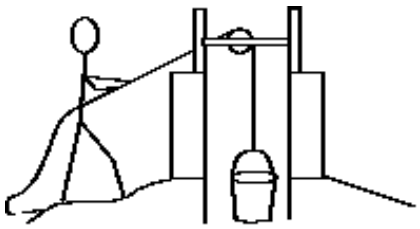
2. Draw a force diagram for the skater, moving at constant speed across frictionless ice. Label the forces and use equality marks on the force vectors.



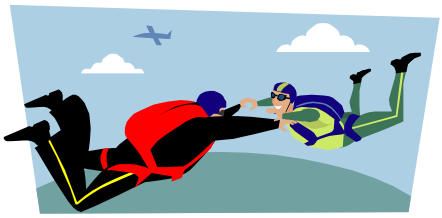
3. Draw a force diagram for the softball player who is slowing as she slides into the base. Label the forces and use equality marks on the force vectors.

4. Draw a force diagram for a chandelier that is suspended from the ceiling by a chain. Label the forces and use equality marks on the force vectors.

5. Draw a force diagram for the bucket of water that is being raised from the well at constant speed. Label the forces and use equality marks on the force vectors.



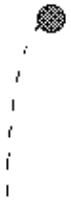
6. Draw a force diagram for a skydiver who has just left the plane and is still speeding up. Label the forces and use equality marks on the force vectors.



7. Draw a force diagram for a skydiver who is descending at a constant velocity. Label the forces and use equality marks on the force vectors.

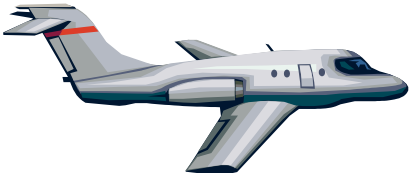
8. Draw a force diagram for a ball rising in a parabolic trajectory. Label the forces and use equality marks on the force vectors.

9. Draw a force diagram for a ball at the top of a parabolic trajectory. Label the forces and use equality marks on the force vectors.

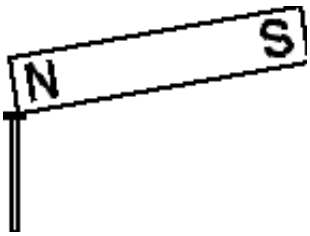


10. Draw a force diagram for a cork floating in water. Label the forces and use equality marks on the force vectors.

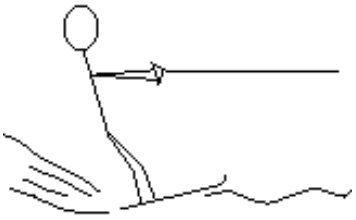
11. Draw a force diagram for an airplane in straight and level flight. Label the forces and use equality marks on the force vectors.



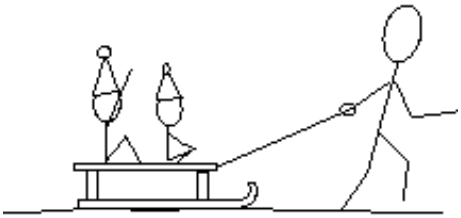
12. Draw a force diagram for a nail that has been picked up by a magnet. Label the forces and use equality marks on the force vectors.



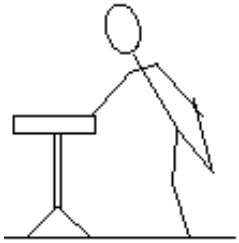

13. Draw a force diagram for the water-skier. Label the force vectors and use equality marks on the vectors.



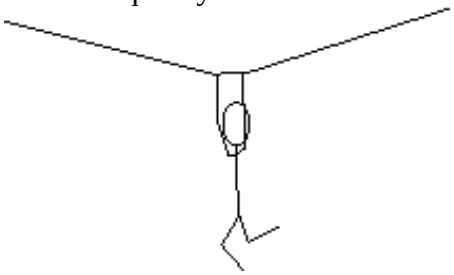
14. Draw a force diagram for the sled and kids. Note that the pull on the sled is at an angle. Label the force vectors and use equality marks on the vectors.



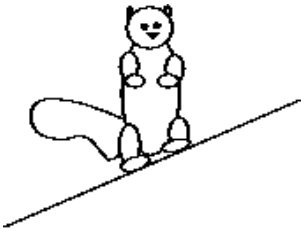
15. Draw a force diagram for the table. The dancer is leaning on the table at an angle while stretching. Label the force vectors and use equality marks on the vectors.



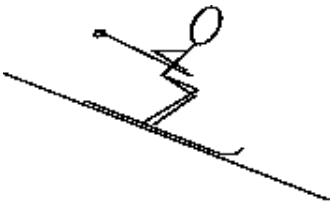
16. Draw a force diagram for the person hanging onto the rope bridge. Label the force vectors and use equality marks on the vectors.



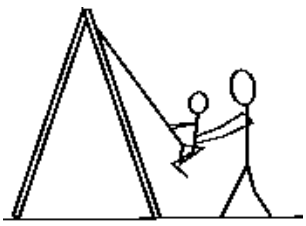
17. Draw a force diagram for a squirrel sitting still on a roof. Label the force vectors and use equality marks on the vectors.



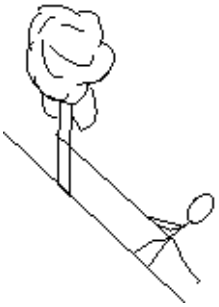
18. Draw a force diagram for the skier who slides with negligible friction. (That means you can ignore the friction force.) Label the force vectors and use equality marks on the vectors.



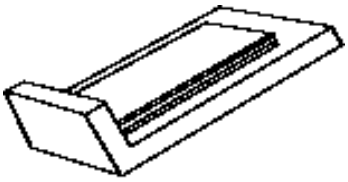
19. Draw a force diagram for the child on the swing being pulled back before being released. Label the force vectors and use equality marks on the vectors.



20. Draw a force diagram for the climber who has stopped to rest. Label the force vectors and use equality marks on the vectors.



21. Draw a force diagram for the magazine on a magazine rack. Label the force vectors and use equality marks on the vectors.



21. Explain what a normal force is and give an example.

22. Can an inanimate object (such as a table) exert a force? Can the magnitude of the force exerted by an inanimate object change? Explain and give an example.

23. If the acceleration of an object is zero, are no forces acting on it? Explain.