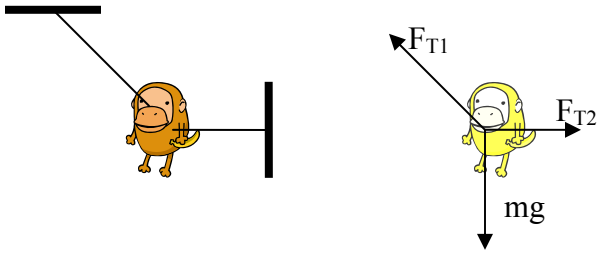
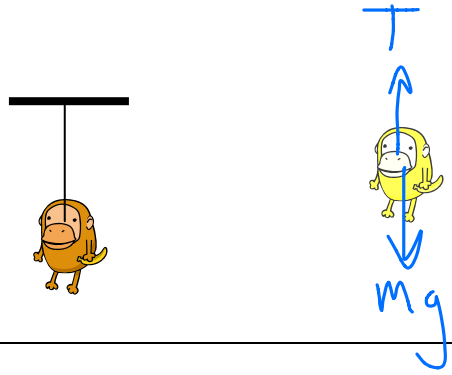
Free-Body Diagrams

In each case an object is acted on by one or more forces. All drawings are in a vertical plane, and friction is negligible except where noted. Draw accurate free-body diagrams showing all forces acting on the object. Use pencil so you can correct mistakes.The first one is done as an example.

1. Static

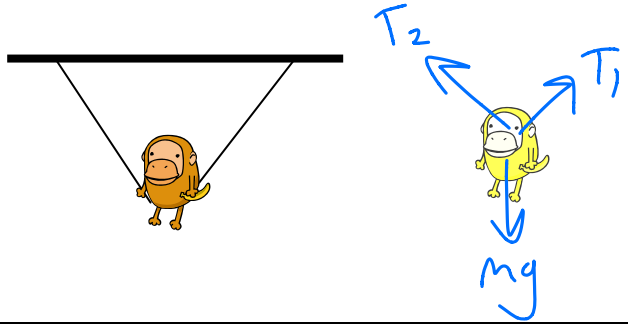


2. Static

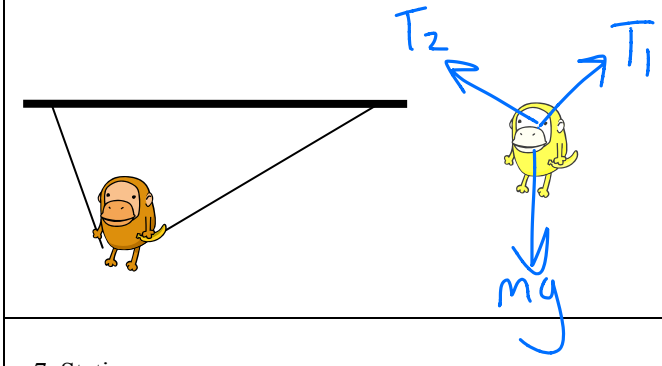


3. Object falling, no air friction.

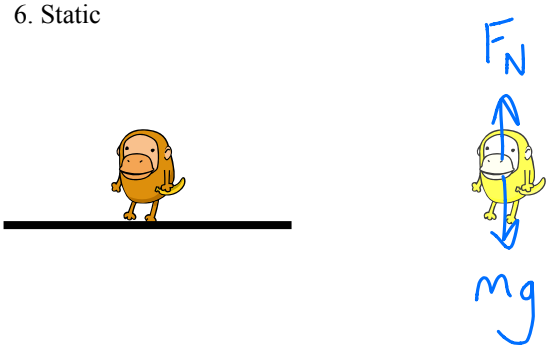
4. Static



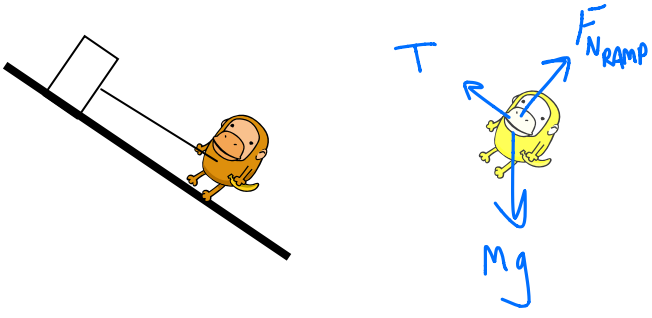
5. Static



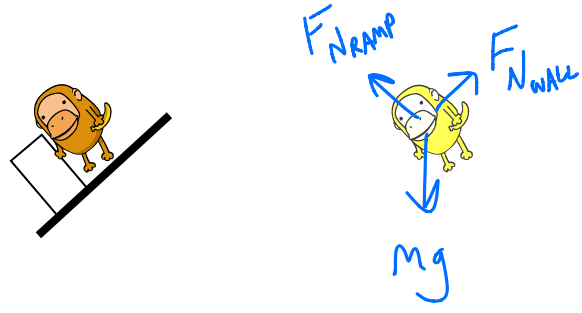
6. Static



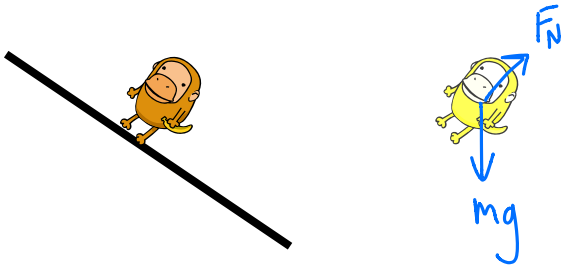
7. Static



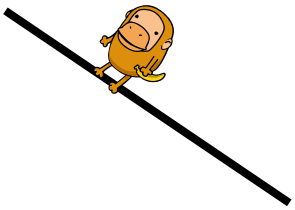
8. Static



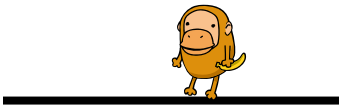
9. Sliding without friction.



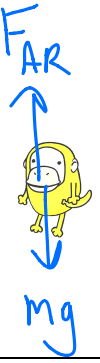
10. Static friction prevents sliding.



11. Sliding at constant speed without friction.

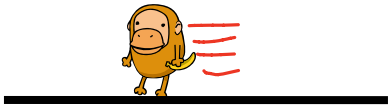


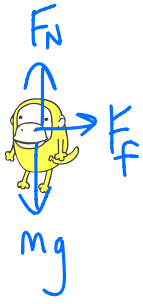
12. Falling at constant (terminal) velocity.



13. Decelerating because of kinetic friction.

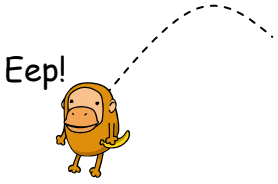
assume moving to the left

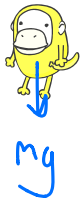




14. Rising in a parabolic trajectory.

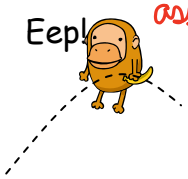
assume no air resistance





15. At the top of a parabolic trajectory.

assume no air resistance



16. Tied to a rope and pulled straight upward. Accelerating upward at 9.8 m/s^2. No friction.