

Principles of Physics I and Lab

[2017 Spring Semester]

The following materials and equipment are **required** for this course. Please read this document carefully and thoroughly.

- Free items

The following items can be obtained without purchase, although a store-bought ruler, protractor, or meter stick may be preferred. Some substitutions may be allowed.

| Item | Source | Note |
|------------------------------|---|--|
| 30 cm Ruler | Paper 30 cm ruler pdf file | For best results, print the file on heavier paper such as card stock. |
| Protractor | Paper protractor pdf file | For best results, print the file on heavier paper such as card stock. |
| Meter-long Tape | paper cut-out meter tape pdf file | There are two meter-long measuring tapes per page. Cut out and tape together the sections carefully. The finished product can be attached to a yardstick or wooden slat to make a 'meter stick'. |
| Timer | Link to an on-line stopwatch | Choose the 'stopwatch' option. |
| Logger Pro Graphing Software | www.vernier.com | Your instructor will provide instructions for downloading and installing this software. Please watch the tutorial - How to use Logger Pro. |

- Office Supplies

The following items can be purchased at any office supply store, or a store that has a Home and Office section. Examples are given.

| Item | Dollar Tree | Dollar General | Walmart |
|-------------|-----------------------------|------------------|---|
| 30 cm Ruler | 'Jot' brand, 2-pk | DG brand, \$0.50 | plastic, \$0.32 |
| Protractor | 'Jot' brand, with a compass | | 'Fiskars' brand, \$2.97, with a compass |

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| String or Thread | 'Craftsman's square' brand, thread 3-pk. | 'Sewing Patch' brand, thread 3-pk, \$1.00 | 'Prym' brand, sewing kit, \$1.00 |
| Paper Clips | 'Jot' brand, 250-ct | DG brand, \$1.00 | 'Casemate' brand, 100 ct, \$1.24 |
| Rubber Bands | 'Jot' brand, 3.5 oz | DG brand, \$1.00 | 'Advantage' brand, \$0.67 |
| Tape | 'Jot' brand, invisible | DG brand, \$1.00 | 'Casemate' brand, \$0.97 |
| Marbles | A bag of 50 marbles and a shooter | 'Imperial' brand, \$1.00 50 plus a shooter | |
| Slinky | plastic Magic Spring | plastic Rainbow Spring, \$1.00 | original metal slinky(TM) \$3.00 |

- Specialty Items

The following items are required for certain experiments but are less likely to be found locally or in a general store.

| Items | Source(s) | Note |
|-----------------------------|---|--|
| 0.5 N Spring Scale | Amazon purchase link | A spring scale is needed for five of the experiments, beginning with Lab #2. |
| Meter Stick/Yard Stick (x2) | Lowe's Purchase Link \$0.98 ea. Walmart \$1.42 ea. in the sewing section | Two yardsticks may be used to make a ramp by taping them together with a cardboard backing. A groove down the middle will guide the marble down the ramp. One yardstick is needed for Lab # 11. The meter-long measuring tape can be attached to a yard stick to make a 'meter stick'. |
| Slinky ^(TM) | Amazon Purchase Link | If a Slinky ^(TM) can't be found locally, here is a link to one at Amazon. |

- Common Items

Some of the experiments require common items typically found around the home. Special purchase is not required: for example, any small item about the size of a house key can be used to make a plumb bob.

| Item | Experiment(s) | Note |
|-------------------------------------|--|--|
| A small weight, such as a house key | <ul style="list-style-type: none"> • Lab #1: Graphing Data • Lab #10: Collisions in Two dimensions | The weight attached to a string serves as a pendulum for Lab #1 and a plumb line for Lab # 10. |

| | | |
|--------------------------------------|--|---|
| Thread or twist tie | <ul style="list-style-type: none"> • Lab #2: Vector Addition | The thread is used to tie three rubber bands together. |
| Large-size book, at least 8.5" x 11" | <ul style="list-style-type: none"> • Lab #2: Vector Addition | The book is the frame to stretch the rubber bands. |
| CD case or paperback book | <ul style="list-style-type: none"> • Lab #5:Frictional Force | The case or book is dragged across a flat surface. |
| Three 12-oz plastic water bottles | <ul style="list-style-type: none"> • Lab #5:Frictional Force • Lab #9: Energy Conservation | The bottles are used as weights; other objects of similar mass may be used instead. |
| Medium-sized book | <ul style="list-style-type: none"> • Lab #9: Energy Conservation | Any objects suitable for dragging against friction or hanging from a rubber band can be used. |
| Can of soda, paperback book, etc. | <ul style="list-style-type: none"> • Lab #11: Static Equilibrium | Any objects suitable for hanging may be used. |
| Any grocery item in a can | <ul style="list-style-type: none"> • Lab #12: The Rolling Can | This is the rolling can. |