

## Fall 2021 Hopper Kit Items

The items below provide the maximum quantities/sizes of materials that may be used for the construction of your final hopper design. You may replenish your supplies as needed during your iterative design process.

| Item | Name                          | Quantity  | Description   |
|------|-------------------------------|-----------|---|
| 1    | Safety glasses                | 1         | self-explanatory...use them!  |
| 2    | Wooden dowel (small diameter) | 5, total  | 12in long Birch dowel rod with diameters (in) of 1/8, 3/16, 1/4                 |
| 3    | Wooden dowel (large diameter) | 1         | 6in long Birch dowel rod with a diameter of 3/4in                               |
| 4    | Fence wire                    | 1         | 6in length of 14ga multipurpose   |
| 5    | HDPE sheet                    | 1         | 1in x 2in x 1/8in sheet of HDPE   |
| 6    | PTFE rod                      | 3, total  | 1in length of solid PTFE (Teflon) rod with diameters (in) of 1/4, 3/8, 1/2      |
| 7    | Aluminum foil                 | 1         | 6in x 6in square of heavy duty aluminum foil                                    |
| 8    | Machine screw                 | 10, total | 4-40 thread pan head phillips machine screw with lengths (in) of 1/2, 3/4, 1.25 |
| 9    | Hex nut or locknut            | 10, total | 4-40 thread nut or nylon-insert locknut   |
| 10   | Craft stick                   | 6, total  | 1/4in wide by 6in long by 1/16in thick craft stick, or mini popsicle            |
| 11   | Ear plug                      | 1         | orange noise-reduction foam ear plug  |
| 12   | Torsion spring                | 2, total  | 90° torsion spring, one left hand, one right hand                               |
| 13   | Rubber tubing                 | 1         | 1 ft length of 1/4in outer diameter by 1/8in inner diameter latex rubber tubing |
| 14   | Rubber band                   | 2         | #64 rubber band   |
| 15   | Plastic tubing                | 1         | 6in length, 4mm outer diameter, black or white polyurethane plastic tubing      |
| 16   | Steel ball bearing            | 2, total  | stainless steel ball bearing with diameters (in) of 3/8 and 1/2                 |
| 17   | Electrical wire               | 1         | 1ft length of insulated solid 22AWG hook-up wire                                |
| 18   | Heat shrink tubing            | 1         | 6in length of .09in inner diameter black heat shrink tubing                     |
| 19   | Magnet                        | 2         | neodymium cylindrical 1/8in outer diameter x 1/8in height                       |
| 20   | Binder clip                   | 1         | mini binder clip  |
| 21   | Cable tie                     | 6, total  | black Nylon cable tie with lengths (in) of 4, 8                                 |
| 22   | Clear line                    | 1         | 3ft length, 0.022in diameter, 30lb load limit, clear monofilament nylon line    |
| 23   | Aluminum rod                  | 1         | solid aluminum rod of 1/8in diameter x 2in length                               |
| 24   | Balloon (large)               | 1         | 12in diameter deep tone   |
| 25   | Balloon (small)               | 2         | 5in diameter  |
| 26   | Balloon (long)                | 1         | long, twisty balloon  |
| 27   | Pencil                        | 1         | #2 wooden pencil with eraser  |
| 28   | Golf ball                     | 1         | yellow recycled golf ball   |
| 29   | Golf tee                      | 2         | 2 1/8in long golf tee   |
| 30   | Sandwich baggie               | 1         | foldover sandwich baggie  |
| 31   | IDEAS ruler                   | 1         | 6in lasercut ruler  |