Makeshift flotation devices for flood victims

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THIRD EDITION

Before reading this book: Please check for an updated edition.

To minimize the risk of drowning, people and pets need a boat or raft. If you do not have one, this booklet enables you to quickly construct makeshift buoyancy devices from common household objects. During Hurricane Harvey and other severe flooding events, emergency personnel were swamped, unable to immediately assist everyone, thus necessitating that those in danger improvise to save themselves and loved ones.

Virtually every home includes things that can provide sufficient buoyancy and be lashed together to form a raft. Given sufficient time and resources, you may also wish to float your car (ideally anchoring it to a large tree) or to similarly tether a stationary raft to safeguard other valuable property.

NOTE: Usage tips in the comment section may also apply to other objects.

Buoyant or potentially buoyant objects	
Item	**Comment**
Refrigerator or freezer	Empty and tape shut or secure door closed with rope, string, fishing line, electrical extension cords, drapery cords, belts, cargo tie-down straps, bungee cords, garden hose, etc. Position door up if affixed to other large flotation devices or large aggregates of smaller ones (discussed below). Principle: Essentially forms a large float providing 62 pounds of buoyancy per cubic foot of interior capacity, so a 25 cubic foot refrigerator provides over 1500 pounds of buoyant force minus the weight of the appliance (generally less than 300 pounds) for a net buoyancy of over 1200 pounds. By similarly displacing water, many other objects can provide buoyancy.
Plastic soft drink, water, milk, shampoo, conditioner, laundry detergent, dishwasher, vitamin, spice, windshield	Empty and re-cap. Many can be tied together in berry-like clusters or used to fill plastic garbage bags or mesh plastic bags.

washer (etc.) bottles; Tupperware with lid; insulated water jugs	Alternatively, tie shower curtains or bed sheets into sacks filled with many small buoyant objects. Can sew, staple, or glue (e.g., hot-melt, super glue) two sheets enveloping buoyant objects to form raft.
Beer or wine bottles	Empty and re-cap. Seal with molten candle wax or hot-melt glue as needed.
Paint cans	Empty and reseal. Before sealing, could nail to a board forming part of a raft; use a metal rod (such as a dumbbell) as a nailing punch.
Aerosol paint cans	Empty.
Tin cans	Empty and reseal. Ones with liquid contents can be emptied with one or two small holes subsequently sealed with hot-melt glue, other adhesives, molten candle wax, etc. Cans that must be emptied by lid removal could be taped end-to-end to another can of the same diameter, sealing with duct tape or electrical tape.
Tires, air mattresses, beach toys, balloons, plastic sandwich bags (with zipper-like seal), plastic garbage bags, basketballs, soccer balls, latex or nitrile gloves	Inflate and use by itself if sufficiently large, tie together, or use to fill a buoyant sack. Areas of plastic sandwich bags above seal can be tacked or stapled to boards or poles (such as from brooms); aggregates of these could covered with carpet, rugs, floor pads, or exercise mats to form a raft.
Garden hoses	Drain & cap or connect together end-to-end.
Plastic tool boxes, trash cans (plastic or metal)	Empty and seal. Generally very sturdy with a handle providing a good attachment point.
Garbage totes	Empty & secure lid closed (such as with duct tape), then seal. A 96-gallon tote provides about 700 pounds of net buoyant force.
Shop vac	Seal with electrical tape or hot-melt glue; place hose end into air outlet.

PVC pipe	Cap ends or connect into loop. Provides buoyancy; larger sizes also provide substantial rigidity useful to form durable rafts.
Gas and kerosene cans (metal or plastic)	Empty and seal.
Air compressor tank	Remove compressor if possible, then seal (e.g., with duct tape, other tape, stickers, various adhesives).
Water pressure tank, hot water tank	Remove after draining (if you know how to safely do this), then seal.
Propane tanks	Empty safely outside away from flame and sparks. Exceptionally sturdy and watertight.
Vacuum storage bags	Normally used for compacting pillows, towels, & blankets during storage; can be filled with lightweight buoyant items & sealed.
Bubble wrap	
Styrofoam cups and insulation (sheets or beads)	All Styrofoam (expanded polystyrene) sheets provide good flotation; thicker blue and pink ones are generally sturdy enough to form a temporary raft. Styrofoam beads (from some attic insulation and furniture) or cups can be stuffed into plastic shopping bags or garbage bags; even if they are not 100% intact, they can envelope the Styrofoam or other buoyant objects to provide buoyancy.
Ice chests and other coolers	Some may provide a watertight seal; otherwise seal manually.
Plastic storage bins	Can be sealed to provide flotation. Some are strong enough to form rafts.
Plastic garbage bags	Once sealed, one 50-gallon bag can support over 400 pounds; ten could float an average car. Preferably fill with other buoyant objects (such as many inflated &

	sealed sandwich bags) so you will still have buoyancy if outer bag is punctured.
Sheet plastic	Can be cinched together to form a sack, then sealed and preferably filled as above with other buoyant objects. If not securely sealed or filled with buoyant objects, keep cinch area above waterline. Plastic sheet can be permanently sealed (air- and watertight) by applying heat for a few seconds with a heat gun, then pressing sheets together to thermally weld them. Alternatives: soldering iron (set on low or plug in intermittent brief “pulses”) or heat a large object (such as a 5- or 10-pound metal barbell weight), rolling it onto the area to be sealed while wearing a thick leather glove. Cover hot objects with Teflon tape (if available) to prevent sticking. If you cannot obtain a good seal at the cinch area, tie it through the handle of one or more milk jugs or other sealed plastic containers to help keep this area above water. Ideally place a plastic bag over the cinch area to shed rain and splashing water.
Plastic cat litter and other large containers	Empty and seal.
Plastic file boxes	Empty and seal.
Water (pool) noodles	
Logs and firewood	Logs provide structure and buoyancy. Can be strapped together to form rafts more resistant to damage than most boats.
Lumber	Wood floats well and is easily nailed together to form rafts (can be glued with waterproof glue if time permits). Nail on Styrofoam sheets or attach other buoyant objects or aggregates of them for added buoyancy.
Open items: garden watering jugs, buckets, magazine holders, plastic drawers, water troughs & tubs, concrete	Some can be inverted to trap air, thus providing buoyancy; generally unstable in that position, necessitating affixing them

mixing tubs, laundry tubs, wheelbarrows	together or to other objects to provide stability. Deeper ones may be able to be used upright (open tops facing up), generally aggregated together to form a series of connected boats that can serve as a raft (if so used, bring a tin can or cup to scoop out incoming rainwater or waves).
Cars and some other vehicles	Cars can be quickly transformed so they float, supporting not only their weight but also that of occupants and potentially thousands of pounds of added cargo. Place one or more large sheets of plastic (such as 6 mil or thicker polyethylene) or rubber onto a smooth paved area previously vacuumed, swept, or hosed off to remove rocks or other debris that could puncture the plastic. Next, drive the vehicle to the center of the plastic, then pull it up, attaching it to the opposite side to hold it up. Plastic sufficiently wide can be tied together; if not, strips of it could be thermally bonded (see the *Sheet plastic* section) as a bridge. Alternatively, wind top sections of the plastic a few times around a small board (a 1x2 is fine), then tack or staple in place before punching holes just below the board, through which rope, strong string or fishing line, electrical extension cords, drapery cords, belts, cargo tie-down straps, bungee cords, or garden hose can be tied to the opposite side or end. Plastic tops could also be wadded and inserted into window areas, raising windows just enough to snug them into place. Or pull plastic tops onto seats and sit on them or anchor in place with heavy objects on seats or floor. If people or pets occupy the vehicle, leave sufficient gaps to provide fresh air. Ideally place sheet plastic over the top and upper sides to shed rain and splashing water.

Makeshift rafts and boats

In addition to the above, many homes contain solid wood interior doors that can be removed by unscrewing hinges or by using a nail or similar object to tap out hinge pins. Plastic, hollow wood, and metal doors can provide structural support (using other objects for buoyancy) or be made buoyant by sealing them.

Plastic milk crates can be tied together to form a raft, using other objects for buoyancy. Ditto for wood drawers, which can be nailed or tied together. Inverting crates or drawers provides spaces to nestle buoyant objects or aggregates of them.

After sealing their drains, plastic bathtubs can form sturdy boats, preferably attaching other objects to improve lateral stability, forming outriggers. Tubs with integral sidewalls should generally have them cut off unless two are joined together (preferably with bolts, nuts, and large washers); with all gaps sealed and sheet plastic draped over the top to shed rain, such an assembly could be filled with many irreplaceable possessions.

Some plastic cabinets and shelves are very sturdy, providing a raft framework, attaching other objects for buoyancy or wrapping the cabinet or shelving unit with sheet plastic to make it buoyant. After removing their cushions, couches, beds, and some other furniture items could be similarly used.

If you have a heat gun, rigid sheet plastic (such as from windows) can be molded to form a boat or raft. Embossing areas (by heating then pushing the plastic or drawing it into cup-like dimples with a shop vac) significantly improves rigidity. Prolonged heating along a line can permit it to be bent at a 90° angle; forming three other sides and taping their joints can form a small boat.

Have a lifesaving tip to add? Please send it to flood@ideateem.com. *Thank you!*