

# HOWTOONS Das Bottle

## MATERIALS:

- 2 PLASTIC WATER BOTTLES
- SCISSORS
- NEEDLE NOSE PLIERS
- 2 PAPER CLIPS
- 3 RUBBER BANDS
- 6 INCH RULER
- CHOPSTICKS

**EXPERIMENT WITH** DRILL A HOLE IN THE BOTTOM OF YOUR BOTTLE. USING CHOPSTICKS FEED A PAPERCLIP THRU.

**DIFFERENT SIZE** USE CHOPSTICKS TO HOOK RUBBER BAND.

**SUBS.** HOOK PAPERCLIP INTO SECOND HOLE.

**POSITIVE**  
WITH MORE OR MOSTLY AIR INSIDE, THE SUB HAS POSITIVE BUOYANCY AND WILL RISE UNDER WATER OR FLOAT ON TOP.

**NEUTRAL**  
WITH JUST ENOUGH AIR INSIDE, THE SUB HAS NEUTRAL BUOYANCY AND WILL STAY LEVEL UNDER WATER.

**NEGATIVE**  
WITH LITTLE OR NO AIR INSIDE, THE SUB HAS NEGATIVE BUOYANCY AND WILL SINK UNDER WATER.

# BUOYANCY

CONNECT STABILIZER FINS WITH TWO RUBBER BANDS.



WITHOUT FINS, PROP AND BOTTLE BOTH SPIN IN OPPOSITE DIRECTIONS



WITH STABILIZING FINS, PROP SPINS, BOTTLE MOVES FORWARD.

FRICITION REDUCTION FOR THE DRIVE TRAIN.



USE A SPACER BETWEEN THE PROP AND THE CAP. PLASTIC THREADED BEADS FROM A BRACELET WORK GREAT.

DRILL HOLE IN BOTTLE CAP

STARIGHTEN PAPER CLIP, AND FEED THROUGH BOTTLE CAP THEN THRU PROPELLER CENTER HOLE. BEND A HOOK INTO SECOND HOLE.

## MAKING THE PROPELLER:



CRUSH. THEN CUT A BOTTLE IN HALF.



TRIM AROUND THE BOTTOM.



CUT THRU THE MIDDLE OF EACH HIGH AND LOW POINT.



ZE' END!