Introduction

Asteroid Deflection!
Imagine astronomers discover an asteroid. It’s unusually massive and it’s hurtling through space with surprising speed—but what sets this one apart from the thousands of asteroids nearby is that it’s on track to crash into Earth. An impact would mean the end of human civilization.

Can you prevent disaster? Astronomers have devised a few methods to do just that. Give them a shot—our planet is counting on you.

Tow It

UI Text: “tow” “done”
Mission Objective: **Tow It**

Tool: **Gravity Tractor**

Tagline: **It’s as awesome as it sounds.**

**Intro:**
In gravity, attraction is mutual: Earth pulls you down, and you pull up on Earth. A spacecraft flying at just the right distance from an asteroid could use the pull of gravity to tow an asteroid onto a safe path.

**Instruction:**
*Place the spacecraft close to the asteroid; then tow the asteroid to a safe path.*

**Bad (time out):** Not quite! You’ll have to fly closer to the asteroid if you really want to tow it. Remember, the closer together two objects are, the stronger the force between them.

**Bad (crash):** Too close—you crashed! If you don’t keep a safe distance from the asteroid, its gravity can suck you in.

**Good:** It took time—a few years—but your gravity tractor pulled the asteroid away from its collision course with Earth. You saved the world, ace!

**Hit It**

UI Text: ‘Hit’ ‘Drag’ ‘Launch’
Mission Objective: Hit It

Tool: Impactor

Tagline: Bumper cars—in space!

Intro:
In bumper cars, if you hit another car from the side, you knock it off course. Your mission today is to crash an unmanned spacecraft into an asteroid, and bump it off course, too. If you do it early enough, even a small change can avert a collision with Earth.

Instruction:
Drag the crosshair to a target on the asteroid and click ‘launch’. But hurry, time is running out!

Bad (not enough deflection): Too little, too late. Try a different point of impact and give it more time.

Bad (very late): What took you so long? Try again—shoot sooner this time.

Good: Way to go! You hit the asteroid hard and derailed it. It’s still big and bad, but it won’t hit Earth.

Eject It

UI Text: ‘Throw’ ‘Rotate’ ‘Shoot’
Mission Objective: Eject It

Tool: Robotic Cannons

Tagline: Shooting dirt and saving Earth.

Intro:
When a gun fires a bullet, it also recoils—it pushes back on the person firing it. That principle can come in handy:
You’ll need to send robots to dig into an asteroid and shoot off chunks of rock.
The resulting recoil will propel the asteroid toward a safe orbit.

Instruction:
Click to place a robot on the asteroid, then drag to angle it. When it’s done drilling, push to fire!

Bad: Not quite! Try a different angle.

Good: Well done, champ!
You can watch the asteroid streak safely by Earth if you aren’t too busy signing autographs.

Blast It
UI Text: ‘Blast’ ‘Drag’ ‘Detonate’

Mission Objective: Blast It

Tool: Atomic Bomb

Tagline: Armageddon? Armageddon!!!

Intro:
An atomic bomb buried inside an asteroid could tear the thing apart—but explosions are unpredictable.
A safer bet would be to detonate a bomb above the surface of the asteroid. This would vaporize a layer of rock, propelling the asteroid in the process.

Instruction:
Pick the size of the bomb and place it. Then press detonate.

Bad (on the surface): Big explosion! But there is no bomb big enough to break an asteroid into pieces small enough to crash into Earth without causing devastation.
Try again.

Good (above the surface): Well played. You placed the bomb above the asteroid so you propelled it without breaking it. Earth will be safe, thanks to you.

Burn it
UI Text: ‘Burn’ ‘Focus’ ‘Done’
Tool: Space Mirror

Mission Objective: Heat It

Tagline: If you can’t beat it, vaporize it.

Intro:
Ever used a magnifying glass to start a fire? The lens focuses the Sun’s light onto one spot, which gets superheated. A giant, curved mirror could do essentially the same thing, vaporizing parts of the asteroid. As jets of gas shoot off, they’d alter the asteroid’s orbit.

Instruction:
Drag on the arrow to focus the Sun’s light and propel it toward a safe orbit.

Bad (timeout): You need to focus! The more you concentrate the light, the hotter the asteroid’s surface gets.

Good: Spot on! You just saved the Earth from destruction. NASA engineers carry you out of the Houston control room on their shoulders, chanting your name. You done good.

Other UI Text: ‘Restart’