

# TABLETOP ATV SAFETY DEMONSTRATION



## SUPPLIES

### Ramp and Platform

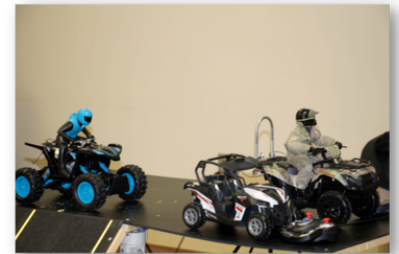
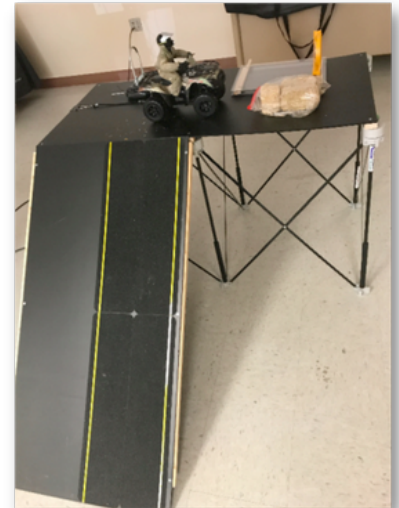
- 2 - Celtec Expanded PVC Sheet, Satin Smooth Finish, 6mm Thick, 24" x 48", Black
- 1 - Centipede Tool K100 6 Strut Expandable 2' X 4' Portable Sawhorse and Work System Kit
- 1 - A0606 Centipede Tool Non-Slip High Friction, Soft Surface Pads for Sawhorse Kit
- 1 - GoSports Premium Cornhole Carrying Case - Regulation Size
- 2 - 8' Furring strip 1" x 2" 1 - Box of 1/2" Wood Screws
- 2 - 3" Gate Hinge
- 2 - 1/8" x 2" Spring Steel Cotter Pin
- 4 - Anti-Slip Tread Tape 6" x 24"
- 1 - Medium Binder Clip

### ATVs

- 1 - Maisto R/C Rock Crawler ATV Remote Control Vehicle
- 1 - Haktoys HAK139 UTV SSV ATV 1:12 Scale RC Car with Lights
- 1 - Kidz Tech 84331 RC Kawasaki Brute Force 750 Vehicle (1:6 Scale), Camo
- 1 - 3/8" x 3-1/2" x 5-1/4" U-Bolt
- 4 - FloraCraft Straw Bales, 2 1/2" x 2 1/2" x 5" Bale
- 4 - 9" x 3/16" Black Mini Bungee Cords
- 4 - Small S-hooks
- 4 - Zip Ties

### Tilt Table

- 2 - 1/2" x 1/2" x 36" Craft Balsa
- 2 - 11" x 14" x .093" Clear Colorless Polycarbonate Sheet
- 1 - Box of 1/2" Wood Screws
- 2 - 1" Screw Post
- 2 - 3/4" Fender Washer
- 1 - Magnetic Angle Locator



## INSTRUCTIONS FOR BUILDING DEMOS

ATV Safety Demonstration 1: <https://youtu.be/FaqITCVoLS8>

ATV Safety Demonstration 2: <https://youtu.be/ion1PJQBdRo>

### GET IN TOUCH

402-552-3394

[go.unmc.edu/cs-cash/cs-cash-contact](http://go.unmc.edu/cs-cash/cs-cash-contact)

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# DISCUSSION POINTS

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## 1. CENTER OF GRAVITY (CG)

The CG is an essential concept in determining the stability of a vehicle. The CG of an object is the point at which weight is evenly dispersed and all sides are in balance. For simple objects like a ball, the CG may be a 'fixed' location – right at the ball's center. When we start to examine more complex objects, like that of the human body, the CG is slightly higher than a person's waist. Why you ask? It's because there is more weight in the upper half of your body than in the lower half of your body. A human's CG can also change as he/she takes on different positions.

**So, what does this have to do with riding ATVs and why do we care about CG?** When the CG goes outside of where the tires touch the ground, the ATV will tip over.

**Where do you think the CG is when you're on an ATV?** The CG is usually between our knees when we are sitting on the ATV. This is because our body becomes a big part of the weight of an ATV, especially when operating smaller ATVs (90cc less). As the ATVs increase in size (110 cc plus), the CG goes down.

## 2. STABILITY

We talked about how the CG is important in determining the stability of a vehicle or object. Using these concepts, we can determine that the lower the CG, the easier it is to keep your balance. (This is why athletes bend their knees and get lower to become more stable). This is where things get tricky – because ATVs are moving vehicles, and we have a moving body, when we are riding on an ATV and adjust/move our body, the CG also moves. The taller and more top heavy an object, the greater likelihood it is to tip over when it is tilted by a force. This is why when you are on a hillside you want to lean UPHILL, so the CG stays inside the line where the tires hit the ground.

### EXAMPLE: TILT TABLE DEMO

In this demonstration, we are going to watch gravity's effects! Using this Tilt Table with a magnetic angle locator, we can measure to what degree, or point that we are going to roll over.

**Any guesses as to where that point will be at/what angle?** *(Place remote ATV on Tilt Table and slowly tilt table until vehicle shows signs of tipping, or rolls off. Watch angle locator to determine degree.)*

**Now what do you think will happen if say, we added some weight...like hay bales?** *(Perform same demonstration action as before, this time adding hay bales to front and back of the ATV.)*

**What happens to the CG?** It moves upwards and back, making it much easier for us to tip, or roll over our vehicle. Looking at the hay bales compared to the overall machine, those hay bales are not significantly heavy. Now imagine if you had an additional rider on there with you? Either way, adding weight to the machine of any kind is ENOUGH to alter the CG, thus changing our stability.

# DISCUSSION POINTS

## 3. CRUSH PROTECTION DEVICE (ROLL BAR)

Has anyone ever tried to go across or climb steep hills on an ATV? Has anyone ever seen something like this on an ATV? (Show ATV with roll bar)

### EXAMPLE: CRUSH PROTECTION DEVICE & RAMP

In this demonstration, we are going to show you how this crush protection device works and why it just may save your life. (Use ATV with attached crush protection device for demonstration. Operate vehicle to go up the ramp...Vehicle should flip backwards as ramp is too steep for ATV to climb.) **Did you see what the crush protection device did? How many of you have ever pulled an ATV back on yourself before?**

## 4. HITCHING

How many of you have ever pulled things with your ATV? Where should you hitch? Drawbar, low, often these work ATVs will have a little plate with a hole in there.

### EXAMPLE: HITCHING LOW OR HIGH

So what happens if we hook in the right spot and we get stuck, and it doesn't pull? (Use ATV with attached crush protection device for demonstration. Using mini bungee cords, attach cord to vehicle low, and then high.) Result - we get stuck and our tires just spin, then we try to back up and get a running start...

**What happens if we hitch higher?** (Use ATV with attached roll bar for demonstration. Using mini bungee cords, attach cord to vehicle higher up, or on roll bar) Result - Vehicle will roll over and may keep rolling over.

## 5. USE THE RIGHT VEHICLE FOR THE RIGHT JOB

(Describe characteristics of vehicles to audience and describe what/how these vehicles should be used)

**Recreational ATV:** Maisto R/C Rock Crawler ATV Remote Control Vehicle

This type of vehicle is designed for recreational use. This is the type of ATV you would use to race with.

- Lower CG
- Greater suspension
- Lighter in weight / Faster in speed
- 4-Wheel Drive
- Tire Size & Traction
- One Rider ONLY

**Work ATV (w/ added crush protection device):** Haktoys HAK139 UTV SSV ATV 1:12 Scale RC Car with Lights

This type of vehicle is also an ATV, but is designed for work purposes.

- Two-Wheel Drive
- Higher CG
- Heavier in Weight (to tow/haul materials/objects)
- Less traction on wheels / Less suspension (vs recreational)
- One rider ONLY

**UTV/Side by Side:** Kidz Tech 84331 RC Kawasaki Brute Force 750 Vehicle (1:6 Scale), Camo

This type of vehicle

- Bucket Seats, Vehicle Doors & Seatbelts
- Roll cage
- Steering Wheel (vs steering handles)
- Lower CG
- Two-Wheel Drive
- One passenger + load