CTC Past Projects for Grades 4-6

Selected CTC 2016 Projects

- Tick Tock Clock
- Smart Shopper
- How to prevent sharks from eating you
- Soccer Penalty Kick

- Computational Thinking Project: Elements Of Steel
- Gobo Adventures
- Protein Builder

Selected CTC 2017 Projects

- Earth's Invasion: The Clock is Ticking!

- Learning about Mythology

- Protein Synthesis Using Bacteriophage

- Computational Model of a Projectile's Trajectory

- Poverty

- Lead Ammunition: Harmful to Raptor & Harmful to Humans

Lead Ammunition:
Harmful to Raptor & Harmful to Humans
[3rd prize winner]

- Motivations
  - Fragments of lead ammunition are killing wildlife.
  - They are also in the meat you eat.
  - Hunters will stop using lead ammunition when they understand about this.

- Design Ideas
  - Write a Scratch program to tell the story.

  A *hunter* shoots an *elk* with a lead *bullet*.

  A *bald eagle* flies over to scavenge on the carcass and eats some ammunition *fragments*.

  The eagle later dies, and the land is polluted by lead.

Sprites used in Scratch

- Hunter (with a gun) – shoot & walk over

- Bald eagle (two costumes to simulate flying)
  - Move towards the deer & bullet fragments
  - Then disappear at the boundary (dies)

- Deer (two costumes)
  - Standing deer
  - Carcass with lead fragments
  - Falling simulated by turning
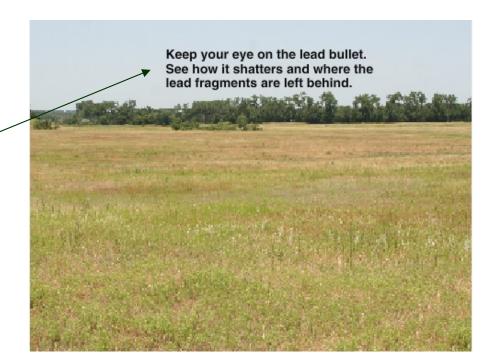
Sprites (Continued)

- Bullet fragments

- Area contaminated by lead fragments

- Stages (woods, star, etc.)

Warning message

Keep your eye on the lead bullet.
See how it shatters and where the
lead fragments are left behind.

Shooting Scene

Keep your eye on the lead bullet.
See how it shatters and where the
lead fragments are left behind.

Script (partial) for the *hunter* sprite:

```
when [flag] clicked
wait 9 secs
move 140 steps
wait 2 secs
move 120 steps
wait 3 secs
move 120 steps
go to front
glide 1 secs to x: 230 y: -139
if < touching Sprite14 ? > then
    move 45 steps
```

Script for the *bullet fragments*:

```
move 235 steps
repeat until < touching Sprite14 ? >
    move 20 steps
switch costume to costume2
play sound StringPluck
stop all sounds
```
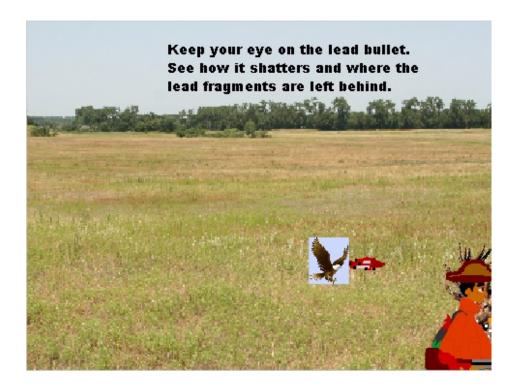
Eagle Scavenging Scene

An eagle eats some lead fragments.

The eagle flies over (from upper left), descends, take off, and flies away (towards lower right).

Keep your eye on the lead bullet. See how it shatters and where the lead fragments are left behind.

Flying: switch between two costumes to show wing flapping.

when 🏴 clicked
repeat until touching Sprite16 ▼ ?
  wait 9 secs
  move 10 steps
  switch costume to 480feb729e39ac1 ▼
  wait 0.5 secs
  move 10 steps
  switch costume to American-bald-eagle ▼
  wait 0.5 secs
  move 10 steps
  switch costume to 480feb729e39ac1 ▼
  wait 0.5 secs
  move 10 steps
  switch costume to American-bald-eagle ▼
  wait 0.5 secs

Ending Scene

Dead animals

Polluted area in the grassland