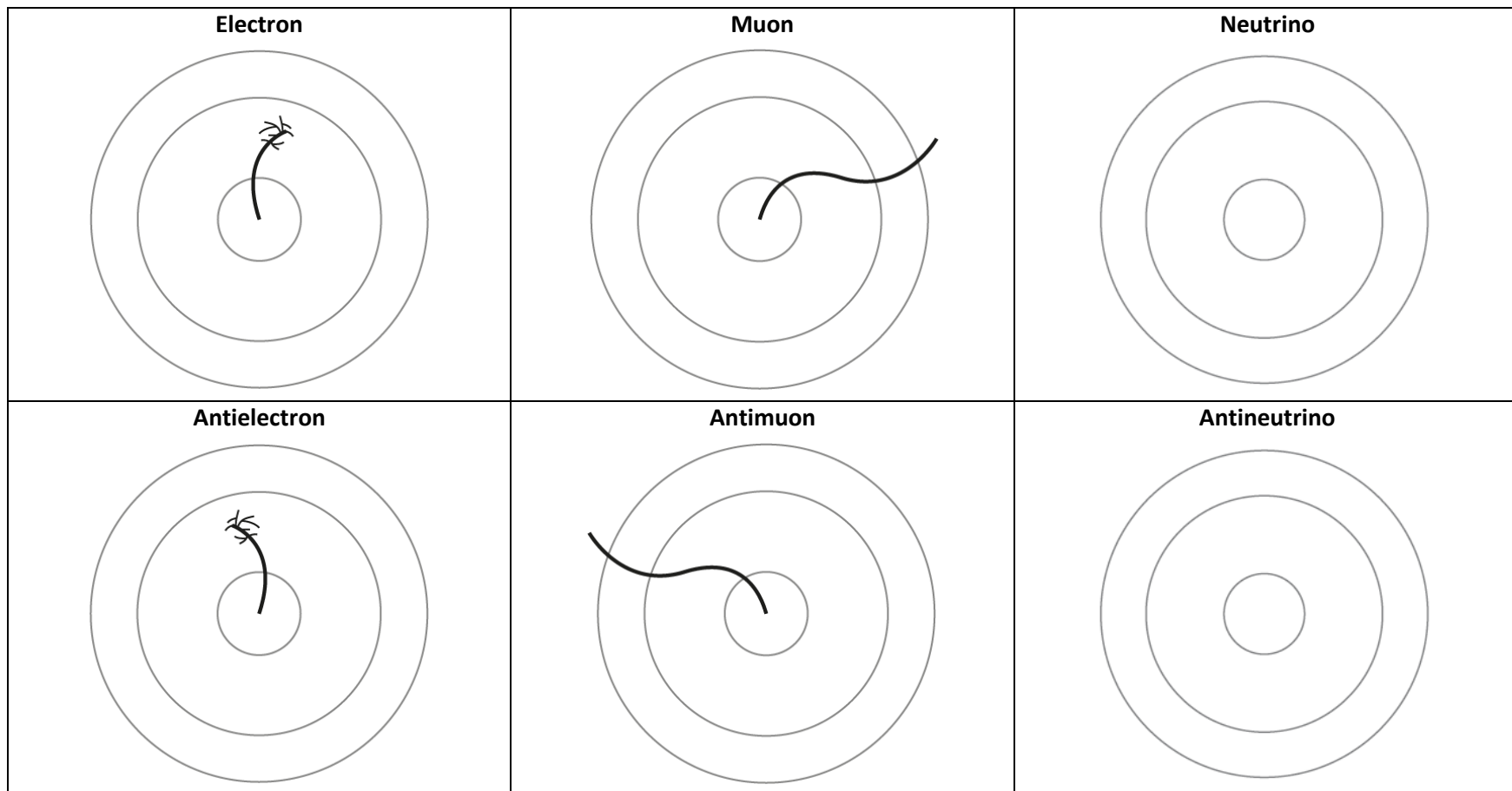


### Pupil worksheet

#### Part 1: What footprints do particles make?

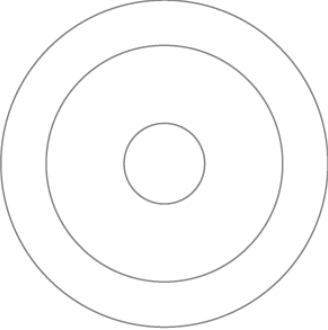
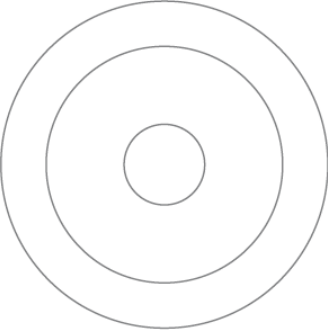
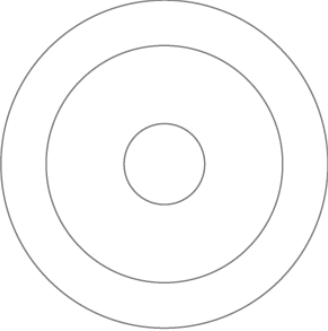
These are the paths made by particles as they pass through the various layers of detectors in the CMS experiment at the LHC.

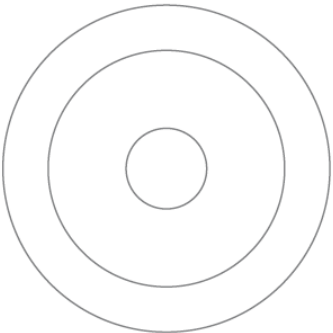
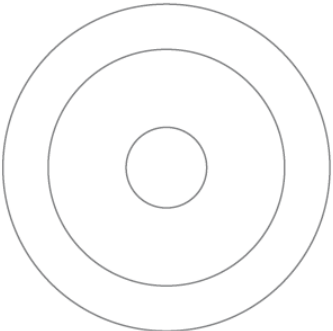
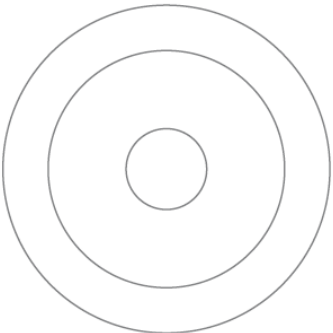


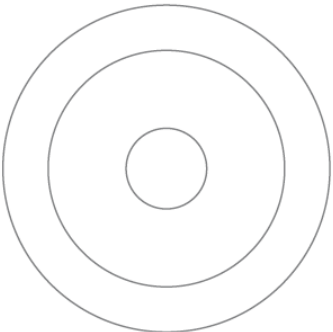
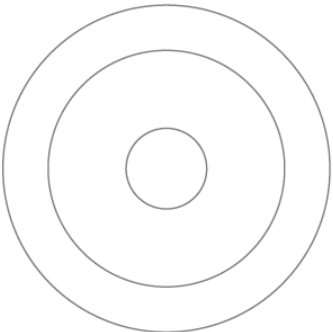
## Pupil worksheet

### Part 2: What do the particles formed on collision of the protons break down into?

Using Part 1 for reference, draw in below the paths of the particles formed on when collision products break down.

Type of particle formed on collision	What it breaks down into	Drawing
1. W Boson	Electron + antineutrino	
2. W Boson	Muon + antineutrino	
3. Z Boson	Electron + antielectron	

4. Z boson	Muon + antimuon	
5. Black hole	Lots of particles	
6. Higgs Boson	2x electron + 2x antielectron	

7. Higgs Boson	2x muon + 2x antimuon	
8. Higgs Boson	electron + antielectron + muon + antimuon	

# Pupil worksheet

## Part 3: Collision images from different particles

Collision image	What particles do you think were present after the protons collided? Why?
