1. Identify the fragment as parietal.

Of the flat bones that make up the cranial vault, the parietal can be identified by its relatively smooth topography. Its basic shape is that of a rectangle that curves outwards (e.g. is convex) as you move towards the occipital and back of the cranium. The frontal and occipital, in contrast, have much more variable topography due to their sulci, sinuses and muscle attachment sites.

<table>
<thead>
<tr>
<th>Bone</th>
<th>Distinguishing features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frontal</td>
<td>First, examine the fragment for changes in thickness. Unlike the parietal, the frontal bone gradually increases in thickness as you move from the superior-most portion of the bone towards the frontal sinus. Though some of the superior frontal curvature and sutures may approximate those of the parietal, the frontal lacks meningeal grooves, which is a dead giveaway that you haven’t got a parietal. Additionally, features will appear where no features should be on a parietal – the frontal has arachnoid foveae dotted about the mid-line portion of the bone, along with a central sagittal sulcus and frontal crest, all in regions where parietal topography should be relatively flat. Finally, the ‘pinched-in’ portions of the frontal that are a result of post-orbital constriction, as well as the thick frontal sinus and smooth curves of the superior orbits provide diagnostic identifiers that let you know you’re dealing with the front of the skull.</td>
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<tr>
<td>Occipital</td>
<td>The occipital is generally thicker and chunkier than the parietal. Large protuberances on the endo- or ectocranial surfaces of the bone (e.g. the cruciform eminence or External Occipital Protuberance), are a good sign that you’re not handling a parietal, which should be smooth and maintain a relatively even thickness along its length. External rugosity is also a deal-breaker – the occipital contains a number of roughened nuchal lines that the neck muscles attach to, while the sole muscle attachment site on the temporal is the comparatively refined and narrow arc of the temporal line. Finally, observing any portions of the smooth, arched lip of the foramen magnum, the rounded openings for the hypoglossal canals or condylar foramina, and the convex facets of the occipital condyles, will all tell you you’re definitely not looking at a parietal.</td>
</tr>
<tr>
<td>Squamous portion of temporal bone</td>
<td>The squamous portion of the temporal bone is much thinner and more fragile than the parietal. If you can, take a minute and examine an articulated cranium. You’ll see that the squamous portion of the temporal overlaps the parietals at the squamosal suture, so that the superior temporal is actually external to the inferior parietal at this location. This means that the parietal striae that denote the squamosal suture are on the external surface of the parietal. In contrast, the temporal bone has an internal “border” (see arrow) that demarcates the area of the squamosal suture, appearing as a thinner and striated band of bone that arches along the entire squamosal plate.</td>
</tr>
</tbody>
</table>

2. Examine any preserved borders and angles.
   (right parietal, ectocranial view)

- A good mnemonic for remembering all of the angles moving from superior anterior to superior posterior is “Friends Spend Money on Osteologists (Frontal, Sphenoid, Occipital, Mastoid).
- The frontal and sphenoid angles are close to right angles, while the occipital and mastoid angles are obtuse (~110°).
- The coronal suture has the straightest edge.
- The lambdoidal suture has the most irregular edge, partially due to the presence of Wormian bones or ossicles within the suture itself.
- The middle portion of the squamosal suture forms a distinctive, slightly flattened arch that is characterized by parietal striations on its external surface.
- The middle segment of the sagittal suture is called the *pars verticis*, and is characterised by sharp, tooth-like serrations (not visible on this schematic drawing).
3. Examine any external features that are preserved.
(right parietal, ectocranial view)

The **parietal boss** is a prominent convexity located on the posterior-superior parietal (see photo below). These are also called “eminences” or “tubers”, and mark the center of ossification for the bone when it is developing. Parietal bosses tend to be more pronounced in female crania.

The **parietal foramen** is variably present, but when it occurs always appears in the posterior-most quadrant of the parietal, in the region above the parietal boss, along the border of the sagittal suture.

**External Features**
- Parietal boss
- Temporal lines
- Parietal striae
- Parietal foramen

The **temporal lines** for the temporal fascia and temporal muscle are variable in their expression. On some individuals they are nearly invisible, while on others they present as distinct and observable lines. However, if you palpate the exterior surface of the mid-parietal region, you can generally feel some rugosity in this area.

The **parietal striae** are located along the curving edge of the squamosal suture, and arch posteriosuperiorly (in layman’s terms, they run up and back). To remember their directionality, imagine running a comb backwards through the hair over your ear.
4. Examine any internal features that are preserved.
(right parietal, endocranial view)

The arachnoid foveae are small pits or depressions that are located anteriorly and superiorly, near the region of the sagittal suture.

The meningeal grooves for the middle meningeal arteries, run up and back along the internal surface of the bone. Those closest to the coronal suture run straight up, while those towards the mid/posterior portions angle posteriorly. Run your open hand through your hair to approximate their directionality ectocranially (see below).

The sigmoid or transverse sulcus is a deep groove located along the base of the posterior and inferior quadrant of the parietal, crossing the mastoid angle. No other sulcus on the parietal is this broad or deep.

Internal Features
- Arachnoid foveae
- Meningeal grooves
- Sigmoid sulcus
- Sagittal sulcus

The sagittal sulcus is a long, narrow groove that runs just below the sagittal suture. This can be used to help identify superior fragments of the bone.