Skull Key to Adult Land Mammals

Although mammalian teeth exhibit similar components, the number, size, shape, and structure of teeth vary widely among mammals. Part of these differences corresponds to differences in diet. Number, size, shape, and structure of teeth also serve as valuable tools in the classification and identification of mammals. As you look at the skulls, keep in mind the general food habits of each species and consider how changes in tooth and skull morphology may better adapt each species for feeding and other uses of its teeth.

The total number of teeth is divided into each of the four basic types of teeth: the incisors, canines, premolars, and molars. The resulting "tooth formula" is divided in to two sections that correspond to the number of teeth of each type in each half of the upper and lower jaws.

Read each couplet below and decide which statement applies to the skull you are observing. Then proceed to the next couplet indicated by the number in bold. For example, if your skull lacks canines, proceed to couplet #2. If your skull has canines, proceed to couplet #6.

Adult humans have 32 teeth. The tooth formula is:
Incisors: 2/2
Canines: 1/1
Premolars: 2/2
Molars: 3/3

This means that humans have a total of 8 incisors (2 on each side of the mouth on the top jaw and 2 on each side of the mouth on the bottom jaw), 4 canines (1 on each side of the mouth on the top jaw and 1 on each side of the mouth on the bottom jaw), 8 premolars (2 on each side of the mouth on the top jaw and 2 on each side of the mouth on the bottom jaw), and 12 molars (3 on each side of the mouth on the top jaw and 3 on each side of the mouth on the bottom jaw).

1a) Skull lacks canines **2**
1b) Skull has canines **6**

2a) Four upper incisors ……..…**Rabbit**
2b) Two upper incisors …….. ..……...**3**

3a) Premolars 0/0, molars 3/3……..……..……**4**
3b) Premolars 1/1, molars 3/3 ……..……**5**

4a) Skull measures approximately 12mm (0.5 inches) wide and is between 22 - 25mm (0.8-1.0 inches) long at its widest and longest points..... **Deer Mouse**
4b) Skull measures 60 - 69mm (2.3 - 2.8 inches) in length and from 38 - 44mm (1.3 - 1.75 inches) in width at its longest and widest points…….....**Muskrat**

5a) Skull measures between 114 - 139mm (4.5 - 5.5 inches) in length and between 79 - 101mm (3.2 - 4.0 inches) in width at its longest and widest points; the skull has 20 teeth with a dental formula of: incisors 1/1, canines 0/0, premolars 1/1, and molars 3/3…….....**Beaver**
5b) Skull measures between 60 - 63mm (2.4 -2.5 inches) long and 31 - 34mm (1.25 -1.4 inches) wide at its longest and widest points; the skull has 22 teeth with a dental formula of: incisors 1/1, canines 0/0, premolars 2/1, and molars 3/3; with large eye orbits..... **Eastern Gray Squirrel**

6a) Skull measures 79 - 127mm (3.1 – 5.0 inches) in length and 57 - 69mm (2.3 -2.8 inches) in width at its longest and widest points; the total number of teeth are 50 with a dental formula of: incisors 5/4, canines 1/1, premolars 3/3, and molars 4/4……..... **Opossum**
6b) Skull has less than 50 teeth ……..……..……**7**

7a) The skull has 34 teeth with a tooth formula of: incisors 3/3, canines 1/1, premolars 3/3, and molars 1/2……..**8**
7b) Any other number of teeth ……..... **9**

8a) Skull measures 60 - 69mm (2.4 -2.8 inches) in length and 38 - 50mm (1.8 - 2.0 inches) in width at its longest and widest points…….....**Skunk**
8b) Skull measures 57 - 59mm (2.3 -3.1 inches) in length and between 31 - 38mm (1.0 - 1.5 inches) in width at its longest and widest points ……..……. **Mink**

9a) Skull measures approximately 15mm (0.6 inches) in length and 9mm (0.3 inches) in width at its longest and widest points; the skull has 38 teeth with a dental formula of: incisors 2/3, canines 1/1, premolars 3/3, and molars 3/3…….....**Little Brown Bat**
9b) The skull is larger than 15mm (0.625in) in length..... **10**

10a) Skull measures approximately 19 - 25mm (0.8 - 1.0 inches) in length and 12mm (0.5 inches) in width at its longest and widest points; the skull has 32 teeth with a dental formula of either incisors 3/1, canines 1/1, premolars 3/1, and molars 3/3 or incisors 4/2, canines 1/0, premolars 2/1, and molars 3/3; teeth are pigmented brownish-red ..... **Short-tailed Shrew**
10b) The skull is larger and the teeth are not pigmented brownish-red **11**

11a) Canines almost the same size as other teeth, skull measures approximately 28 - 38mm (1.1 - 1.5 inches) in length and 19mm (0.75 inches) in width at its longest and widest points; rostrum is elongated; the skull has 36 teeth with a dental formula of incisors 3/2, canines 1/0, premolars 3/3, and molars 3/3……..……**Eastern Mole**
11b) Canines distinctly longer than other teeth……..……**12**

12a) Eye orbits large compared to skull size; skull measures between 101 - 139mm (4.0 - 5.5 inches) in length and between 69 and 104mm (2.8 - 4.1 inches) in width at its longest and widest points; the skull has 28 teeth with a dental formula of: incisors 3/3, canines 1/1, premolars 2/2, and molars 1/1…**Bobcat**
12b) Number of teeth is 40 or more…..... **13**

13a) Skull large, length over 250 mm (9.8 inches), three lower molars, 42 teeth ……...……..**Black bear**
13b) Skull less than 250 mm (9.84 inches) ……..……**14**

14a) Skull length less than 150 mm (5.91 inches) …… **15**
14b) Skull length greater than 150 mm (5.91 inches) …… ……..……..**Coyote**

15a) Hard palate on roof of mouth extends past the last molar; skull measures 107 - 127mm in length (4.3 – 5.0 inches), and between 69 - 73mm (2.5 - 2.9 inches) in width at its longest and widest points; skull has 40 teeth, the dental formula is: incisors 3/3, canines 1/1, premolars 4/4, and molars 2/2… **Raccoon**
15b) Pre-molars not 4/4, length less than 33 mm (1.30 inches)…… ...……**Weasel**

The following skulls are identified in this lab.

1. mink
2. skunk
3. muskrat
4. raccoon
5. coyote
6. bobcat
7. bear
8. beaver