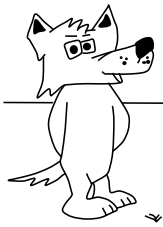
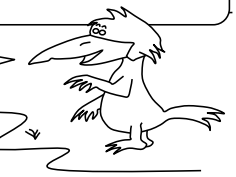
VOLUME OF SPHERES

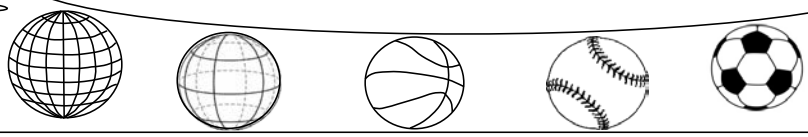
NAME:



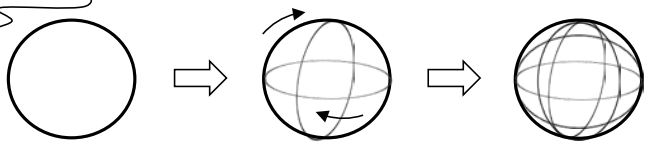
THE EQUATION FOR FINDING THE VOLUME OF A SPHERE IS PROBABLY THE MOST DIFFICULT TO EXPLAIN, BUT WE WILL USE A SIMPLE EXAMPLE THAT HOPEFULLY WILL HELP YOU BETTER UNDERSTAND THE EQUATION.

BELOW ARE SOME EXAMPLES OF SPHERES. AS YOU CAN SEE SPHERES ARE LIKE BALLS AND GLOBES.

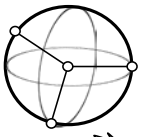




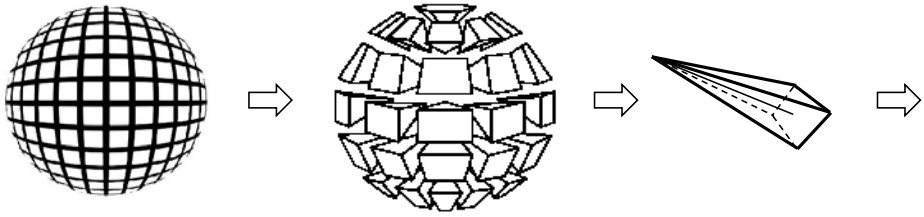
A SPHERE IS A PERFECTLY ROUND OBJECT THAT IS THREE DIMENSIONAL. EVERY POINT ON ITS SURFACE IS THE EXACT SAME DISTANCE FROM ITS CENTER. IT IS LIKE A CIRCLE THAT HAS BEEN SPUN AROUND AND AROUND.



ALL POINTS ARE THE SAME DISTANCE FROM THE CENTER.

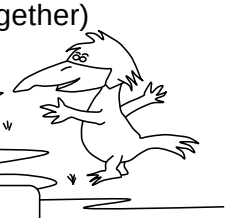


IF YOU TAKE A SPHERE AND CUT IT INTO MANY SQUARES AND THEN CONNECT THE SQUARES TO THE CENTER OF THE SPHERE YOU WILL HAVE MANY PYRAMIDS.



YOU ALREADY KNOW HOW TO FIND THE VOLUME OF A PYRAMID, (AREA of BASE x HEIGHT) ÷ 3. THE HEIGHT IS THE RADIUS OF THE SPHERE AND WE KNOW TO DIVIDE BY THREE, BUT HOW MANY OF THESE TINY PYRAMIDS DO WE HAVE? IN OTHER WORDS, HOW DO WE FIND THE AREA OF ALL THE BASES?

(r ÷ 3) x (area of all the bases put together) = $\frac{r}{3}$ x (area of all the bases put together)



WAIT A SECOND...IF WE NEED TO FIND THE AREA OF ALL THE BASES THAN THAT IS THE SAME AS THE SURFACE AREA OF THE ENTIRE SPHERE AND THE EQUATION FOR THE SURFACE AREA OF A SPHERE IS $4\pi r^2$.

POE, THAT'S IT. SO TO FIND THE VOLUME OF A SPHERE WE USE THE EQUATION BELOW.

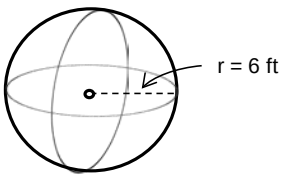
(r ÷ 3) x (surface area of sphere) or $\frac{r}{3}$ x ($4\pi r^2$) or $\frac{4}{3}\pi r^3$

YOU CAN MOVE THE 4 TO THE FRACTION AND COMBINE THE r's.

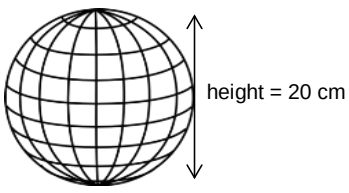
VOLUME of SPHERE = $\frac{4}{3}\pi r^3$

Find the volume of each shape. Use π = 3.14 and round all answers to the nearest whole number.

1.



2.



3.