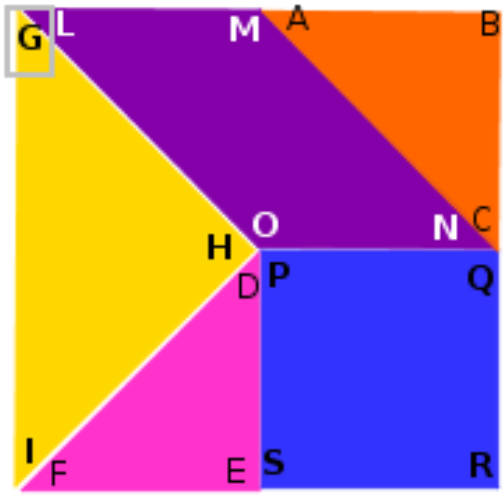
Fun with triangles and quadrilaterals
- Make your own shapes!

Instruction manual:

Activity-1

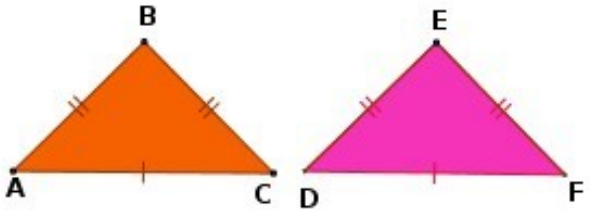
1.) Observe the figure below.
You see 5 shapes put together to form a larger shape.



2) Now let us make each of these figures with our own dimensions and see if we can put it back together. Before we cut out, see if there is any connection between the sides of each of these figures.

3) Let us see how the sides of each shape are related.

- ***First*, let us look at the two *small triangles* – orange (△ABC) and pink (△DEF).**

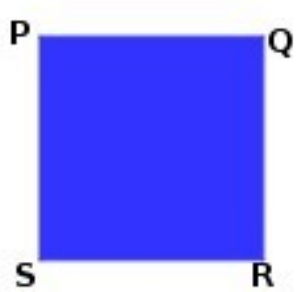


In each of the orange (△ABC) and pink (△DEF) triangle, two sides are equal.Such triangles have a special name – do you remember?

In △ABC, *AB* and *AC* are equal and in △DEF, *DE* and *DF* are equal. Also in the two triangles △ABC and △DEF --> *AB = DE, BC= EF and AC = DF*. The orange (△ABC) and pink (△DEF) triangles are exactly the same size – can you make out?

Try and cut them out in such a manner that you can keep one on top of the other.

- ***Second*, let us look at the square PQRS .**



What is the side of the square PQRS equal to? Can you guess? See the sides PQ, QR, RS *and* SP. Can you see any connection with the sides of the triangle?

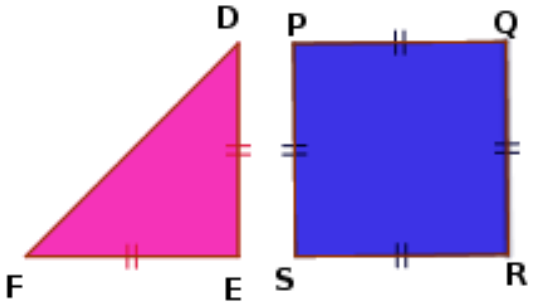
All sides of a square are equal.
In △DEF and square PQRS,

PS = DE = DE = EF

PQ = DE = DE = EF

QR = DE = DE = EF

RS = DE = DE = EF



From above we have also seen that orange (△PQR) and pink (△DEF) triangles are same.

Hence,

PS = DE = DE, = EF QR = DE = DE = EF

PQ = DE = DE, = EF RS = DE = DE = EF

Can you make the triangle now?? you make the triangle now??

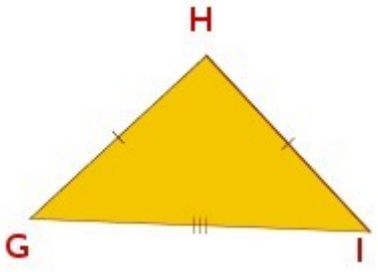
- ***Third*, let us look at the yellow triangle (△GHI)– is there anything special about this triangle?**

  In this triangle – *are all sides equal?*

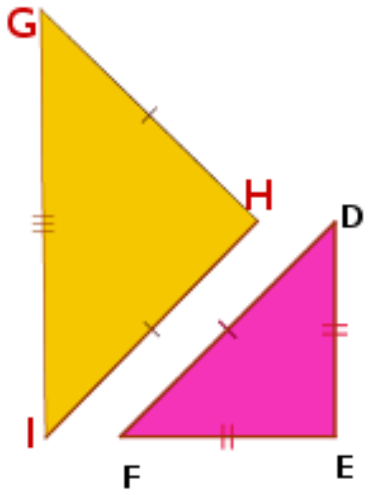
  -- *are two sides equal?*or

  -- *Nothing equal?*

  If equal, which sides are equal?



***Compare this with the pink and yellow triangle*.**



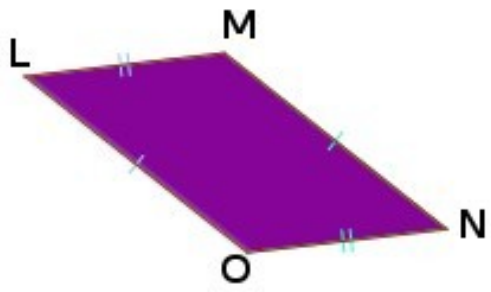
The smaller side of the yellow triangle (△GH) must be equal to the larger side of the pink triangle.(△DEF).

That is, in △DEF *and* △GHI ---> DF = DE = DE = EF

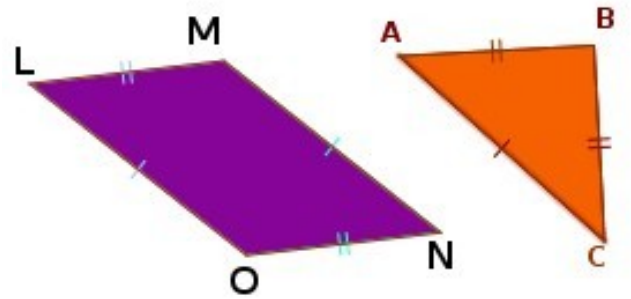
Also since orange (△PQR) and pink (△DEF) triangles are same.

--->AC = DE = DE = EF

- **Now you are ready to look at the last figure – which is a parallelogram LMNO. What is special about this figure? Can you guess?**

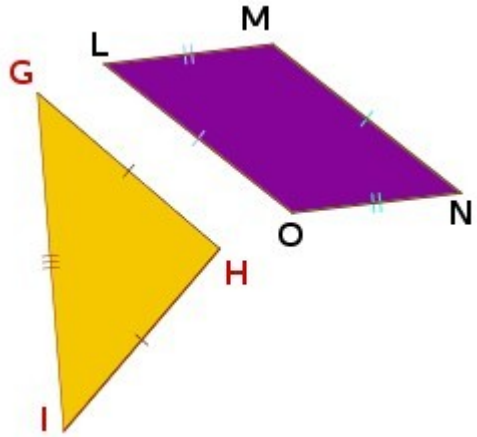


Cut the parallelogram LMNO matching one side with the orange triangle (△ABC) and one side with the yellow triangle (△GHI)
That is, in △ABC an yo parallelogram LMNO gle now??d



LO = DE = ADE, an F you make the tr
LM = DE = DE = DE = EF

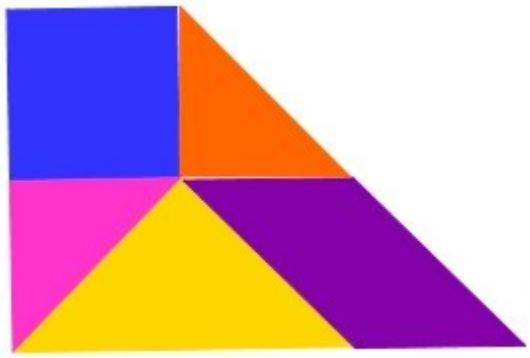
In △GHI an yo parallelogram LMNO gle n
HI = DE = DE = DE = EF
(In parallelogram opposite sides are equal that is, LM = ON and LO = MN)



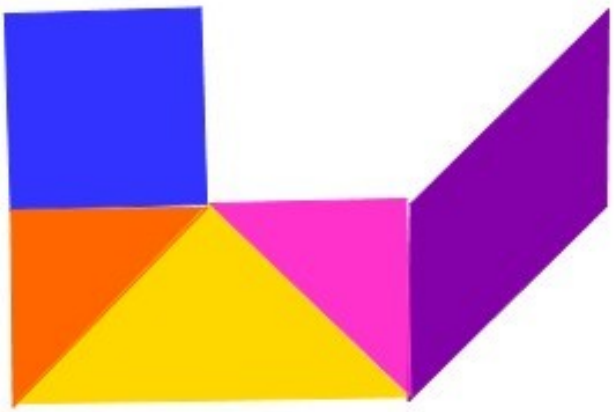
--> Now that you have cut them out - put them back together to make the shape you saw.

3) Try and put the shape below together, follow the above example.

(i)



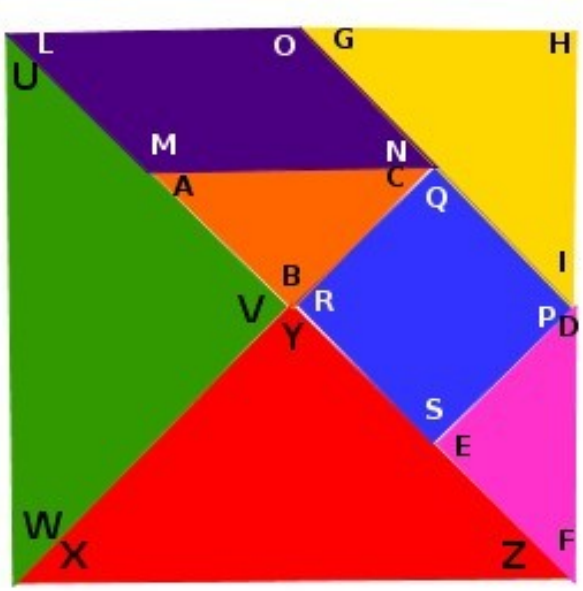
(ii)



4) If you stick your shapes on cardboard, you have your own *Tangram* shapes!

Activity-2 (Using 7-shapes)

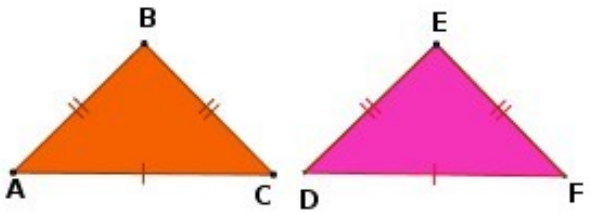
1.) Observe the figure below.
You see 7 shapes put together to form a larger shape.



2) Now let us make each of these figures with our own dimensions and see if we can put it back together. Before we cut out, see if there is any connection between the sides of each of these figures.

3) Let us see how the sides of each shape are related.

- ***First*, let us look at the two *small triangles* – orange (△ABC) and pink (△DEF).**

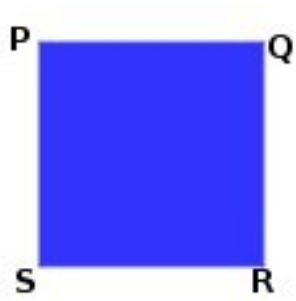


In each of the orange (△ABC) and pink (△DEF) triangle, two sides are equal.Such triangles have a special name – do you remember?

In △ABC, *AB* and *AC* are equal and in △DEF, *DE* and *DF* are equal. Also in the two triangles △ABC and △DEF --> *AB = DE, BC= EF and AC = DF*. The orange (△ABC) and pink (△DEF) triangles are exactly the same size – can you make out?

Try and cut them out in such a manner that you can keep one on top of the other.

- ***Second*, let us look at the square PQRS .**



What is the side of the square PQRS equal to? Can you guess? See the sides PQ, QR, RS *and* SP. Can you see any connection with the sides of the triangle?

All sides of a square are equal.

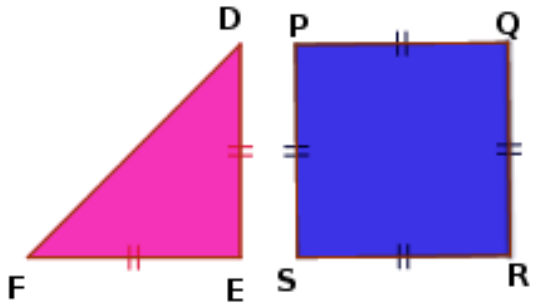
In △DEF and square PQRS,

PS = DE = DE = EF

PQ = DE = DE = EF

QR = DE = DE = EF

RS = DE = DE = EF



From above we have also seen that orange (△PQR) and pink (△DEF) triangles are same.

Hence,

PS = DE = DE, = EF QR = DE = DF = EF

PQ = DE = DE, = EF RS = DE = DF = EF

Can you make the triangle now?? you make the triangle now??

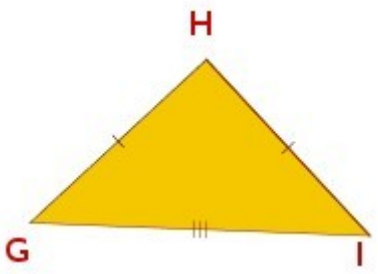
- ***Third*, let us look at the yellow triangle (△GHI)– is there anything special about this triangle?**

In this triangle – *are all sides equal?*

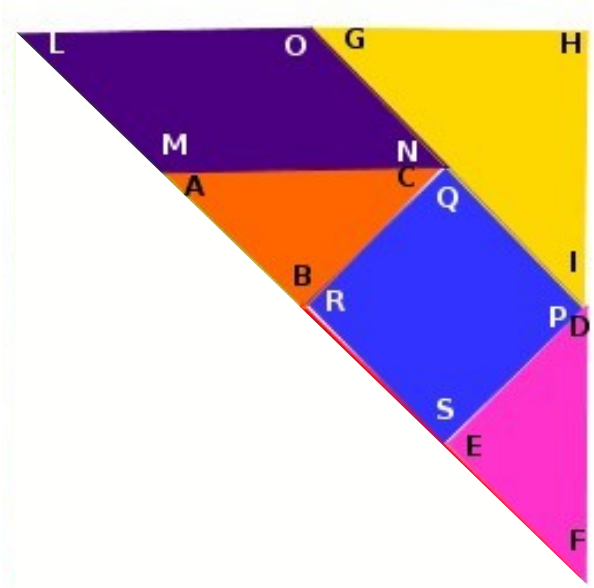
-- *are two sides equal?*or

-- *Nothing equal?*

If equal, which sides are equal?



Compare the longer side of yellow triangle, with sides of parallelogram LMNO and square PQRS



What do you see?

GI = ON + QP, that is these sides of parallelogram and square makes side GI of yellow triangle GHI.

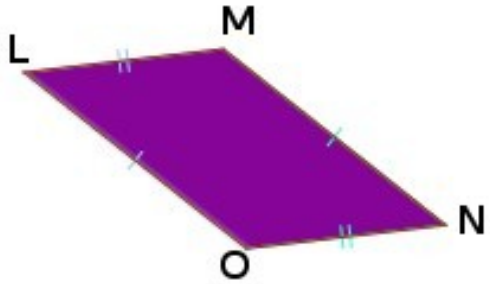
Also, the smaller side of the yellow triangle (△GH) must be equal to the larger side of the pink triangle.(△DEF).

That is, in *△DEF and* △GHI ---> DF = DE = DE = EF

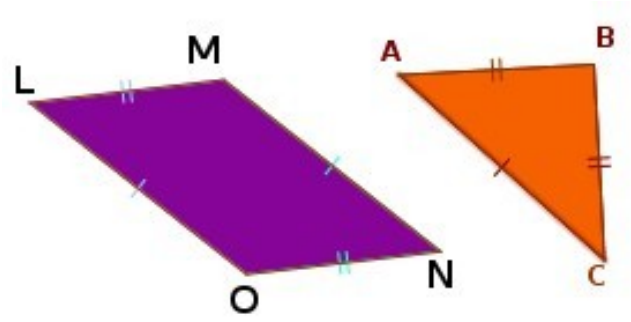
Also since orange (△PQR) and pink (△DEF) triangles are same.

--->AC = DE = DE = EF

- **Now you are ready to look at this figure – which is a parallelogram LMNO. What is special about this figure? Can you guess?**



Cut the parallelogram LMNO matching one side with the orange triangle (△ABC) and one side with the yellow triangle (△GHI)
That is, in △ABC an yparallelogram LMNOngle now??d



LO = DE = ADE, an EF you make the tr
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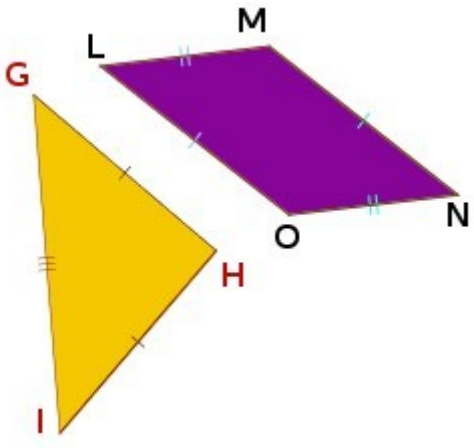
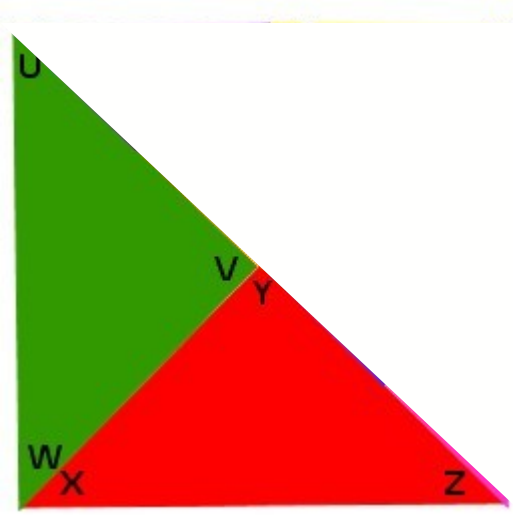
HI = DE = DE = DE = EF

(In parallelogram opposite sides are equal that is, LM = ON and LO = MN)



- **Now you are ready to look at last figures – which is are the large triangles- red (△XYZ) and green (△UVW) triangles.**

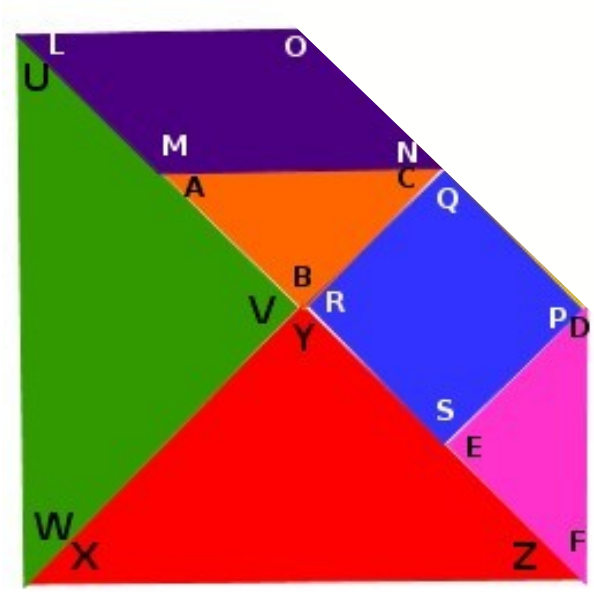


In this triangle – *are all sides equal?*
-- *are two sides equal?*or
-- *Nothing equal?*
If equal, which sides are equal?

In △UVW, UV = DE and if you make, XY = DE, you can also see that XY = DE and hence XY = DE = EF

You can also see

The red (△XYZ) and green (△UVW) triangles are exactly the same size – can you make out?



Also see, how are sides of green and red triangle related to other shapes????

We see UV = DE = AB; *that is these sides of parallelogram LMNO and orange triangle (△ABC)makes side UV of green triangle (△UVW).*

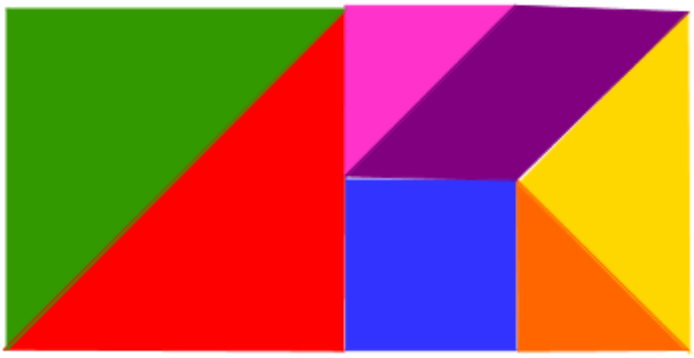
And we see, YZ = ON = QP, that is these sides of parallelogram LMNO and square PQRS makes side YZ of red triangle (△XYZ).

Try and cut them out in such a manner that you can keep red and green triangles one on top of the other.

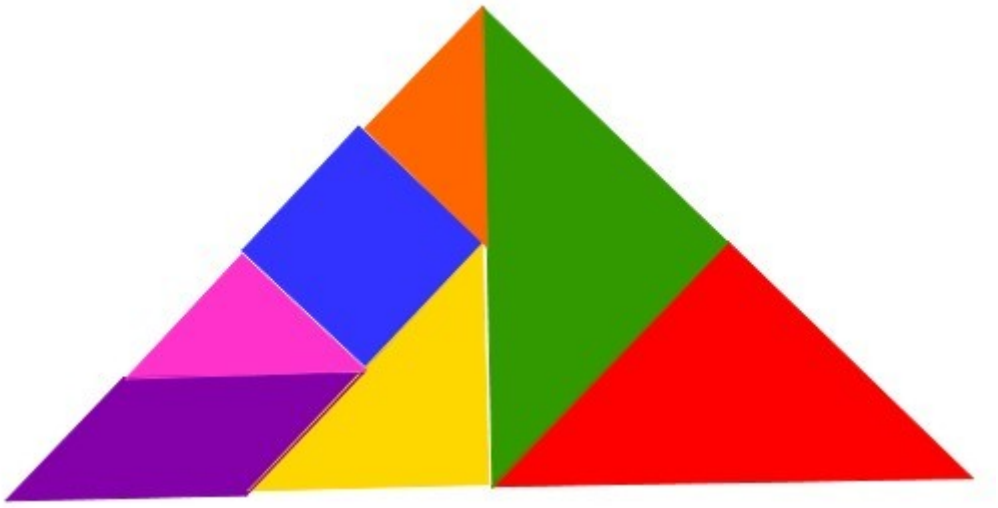
--> Now that you have cut them out - put them back together to make the shape you saw. (the larger square)

3) Try and put the shape below together, follow the above example.

(i)



(ii)



4) If you stick your shapes on cardboard, you have your own *Tangram* shapes!