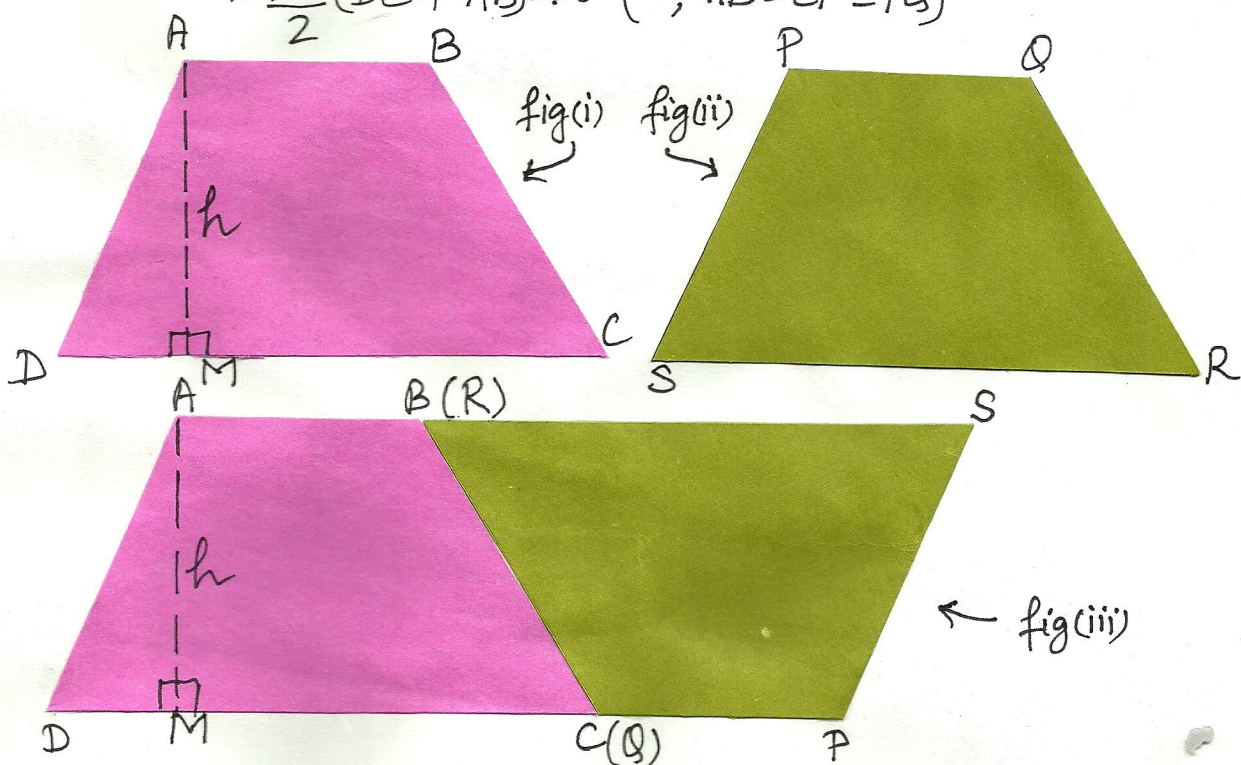CLASS: IX. MATH ACTIVITY NO.: 3. AREA OF A TRAPEZIUM.

OBJECTIVE: To find a formula for the area of a trapezium.

DESIGN AND OR APPROACH TO THE ACTIVITY: 1) Formula for area of a parallelogram. 2) Definition of a trapezium 3). Altitude of a trapezium.

PROCEDURE: 1) Take two papers each of two different colours. 2) Draw a trapezium ABCD on one of the 4 papers. 3) Cut the 4 papers together alongside the trapezium ABCD to get 4 identical trapeziums. 4) Paste one trapezium of each colour as shown in fig(i) & fig(ii). and name them ABCD and PQRS. 5) Now, paste the second cut of trapezium ABCD and paste the second cut-out of trapezium PQRS in such a way that Q and R coincide with C and B respectively (fig(iii)) 6) Draw altitude AM of the parallelogram ASPD thus obtained and call it h. 7) Area of parallelogram ASPD = DP × h (as area of a parallelogram = Base × Corresponding height. 8) Now, area of trapezium ABCD = $\frac{1}{2}$ × Area of parallelogram ASPD. 9) Area of trapezium ABCD = $\frac{1}{2}$ DP × h

$$= \frac{1}{2}(DC + CP) \times h$$

$$= \frac{1}{2}(DC + AB) \times h \quad (\because AB = CP = PQ)$$

fig(i)   fig(ii)

← fig(iii)

CONCLUSION :

1) $BC = QR$ ($\because$ RQ will coincide with BC)

2) $DC + CP = AB + BS$ ($\because$ DP = AS & DP ‖ AS)

3) ASPD is a parallelogram ($\because$ one pair of opposite sides is equal and parallel.)

Thus, Area of a trapezium

$$= \frac{1}{2} \times (\text{sum of parallel sides}) \times \text{Distance between them}.$$