

Explore Screen

Discover how an area model can be used to justify the product of two numbers, that the product/area can be partitioned into smaller products/areas, and that the total area is the sum of the partial areas.

CLEAR the area rectangle

PARTITION the area rectangle

COORDINATE the calculation with the area model

CHANGE the dimensions

SHOW/HIDE total area

SHOW partial products on the area rectangle

Dimensions: 13×15

Total area of model: Area = 195

Partial products: A, $a \times b$

Area model calculation: $(5 \times 10) + (5 \times 5) + (8 \times 10) + (8 \times 5)$
 $50 + 25 + 80 + 40$

Area Model Multiplication | PHET

Generic Screen

Apply the area model to justify the product of two integers using a generic model.

EDIT the partitions

SEE the detailed area calculation

CHANGE the number of partitions

Dimensions: -75×197

Total area of model: -14775

Partial products: A, $a \times b$

Area model calculation: $(-80 \times 100) + (-80 \times 90) + (-80 \times 7) + (5 \times 100) + (5 \times 90) + (5 \times 7)$
 $(-8000) + (-7200) + (-560) + 500 + 450 + 35$
 -14775

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Game Screen

Test your understanding of the area model by finding missing partial products, dimensions, or total area.

Level 1: Find 1 partial product or total area

Level 2: Find 2 partial products or 1 partial product and total area

Level 3: Find 2 partial dimensions or 1 partial dimension and 1 partial product

Level 4: Find 2 partial dimensions or 1 partial dimension and 1 partial product

Level 5: Find factors of single x double or single x triple digit problems

Level 6: Find factors of double x double digit problems

VIEW status of the game level

FIND missing information stated

START OVER to reset progress

SUBMIT answers using the edit buttons

Design Notes

- On the Explore screen, the area rectangle drag handle is useful for initial exploration, and the number spinners are useful for more precise configurations.
- On the Explore screen, multiplying numbers less than 10 in the 100x100 grid will result in very small areas displayed on the area grid.
- Multiplication of 5×7 will not lead to as rich of a discussion as 15×7 or 15×17 . Encourage students to justify why partitioning dimensions larger than 10 is useful, and describe a useful partition strategy.

Suggestions for Use

Sample Challenge Prompts

- Look at each line of the calculation. Where is that represented in the area model?
- Given a total area, find the dimensions. Can you find other dimensions that produce the same total area?

See all published activities for Area Model Multiplication [here](#).

For more tips on using PhET sims with your students, see [Tips for Using PhET](#).