ANSWER KEY

DO NOT HAND OUT

A PREDICTIONS THAT EARN FULL MARKS

Selected product	Accept any reasoned prediction about which named product may move water farther along a matched bridge in 60 minutes. Judge it from all three measured bridges; thickness alone does not identify a winner.

B VARIABLES

Independent	Selected named paper-towel product; record brand, product and supplied ply.
Dependent	Wet-front distance along the towel at 15, 30 and 60 minutes for each of three bridges; separately record the first scheduled check with a visible drop in the receiver.
Controlled	Cup material/size, source volume and dye amount, starting temperature/level, strip length/width and fold, immersion depth, cup gap, tray level and observation schedule.

C SAMPLE DATA

All nine rows are illustrative practice data, not measured class results or targets. Arrival intervals use the scheduled last-dry and first-wet checks, not exact arrival times. Use actual readings in class and expect product/setup variation.

PRODUCT · TRIAL	15 MIN FRONT (CM)	30 MIN FRONT (CM)	60 MIN FRONT (CM)	ARRIVAL INTERVAL (LAST DRY TO FIRST WET, MIN)
Thin · 1	3	6	**9**	**120–240**
Thin · 2	4	7	**10**	**120–240**
Thin · 3	3	6	**8**	**60–120**
Thick · 1	4	8	**12**	**60–120**
Thick · 2	3	7	**11**	**120–240**
Thick · 3	5	8	**12**	**60–120**
Recycled · 1	2	5	**8**	**120–240**
Recycled · 2	3	5	**7**	**240–360**
Recycled · 3	2	4	**7**	**Not reached by 6 h**

Check that each product has three independent rows, units are centimeters and minutes, wet-front distance is measured along the towel, and an unarrived cup is recorded as not reached by six hours rather than given an invented time.

D MODEL CLAIM, EVIDENCE, REASONING

Claim: In these illustrative readings, the thick selected product has the greatest mean wet-front distance at 60 minutes; this sample does not predict which product will lead in another setup.
Evidence: The three 60-minute sample distances are 9, 10 and 8 cm for thin; 12, 11 and 12 cm for thick; and 8, 7 and 7 cm for recycled.
Reasoning: Narrow spaces among cellulose fibers support capillary movement, while gravity helps water descend after the fold. Product construction and bridge geometry affect the measurements, so the sample supports only a comparison of these example trials.

E THINK FURTHER

Repeat the three-bridge set for one selected product with a different measured cup gap while holding strip dimensions, water amount and cup shape constant; compare the new wet-front distances.

F QUICK GRADING GUIDE

Credit conclusions that use the student's actual front-distance and arrival records with consistent units. Require matched strips and cups, an observation endpoint, and a capillary-action explanation. Treat sample values as illustrative, not required results.