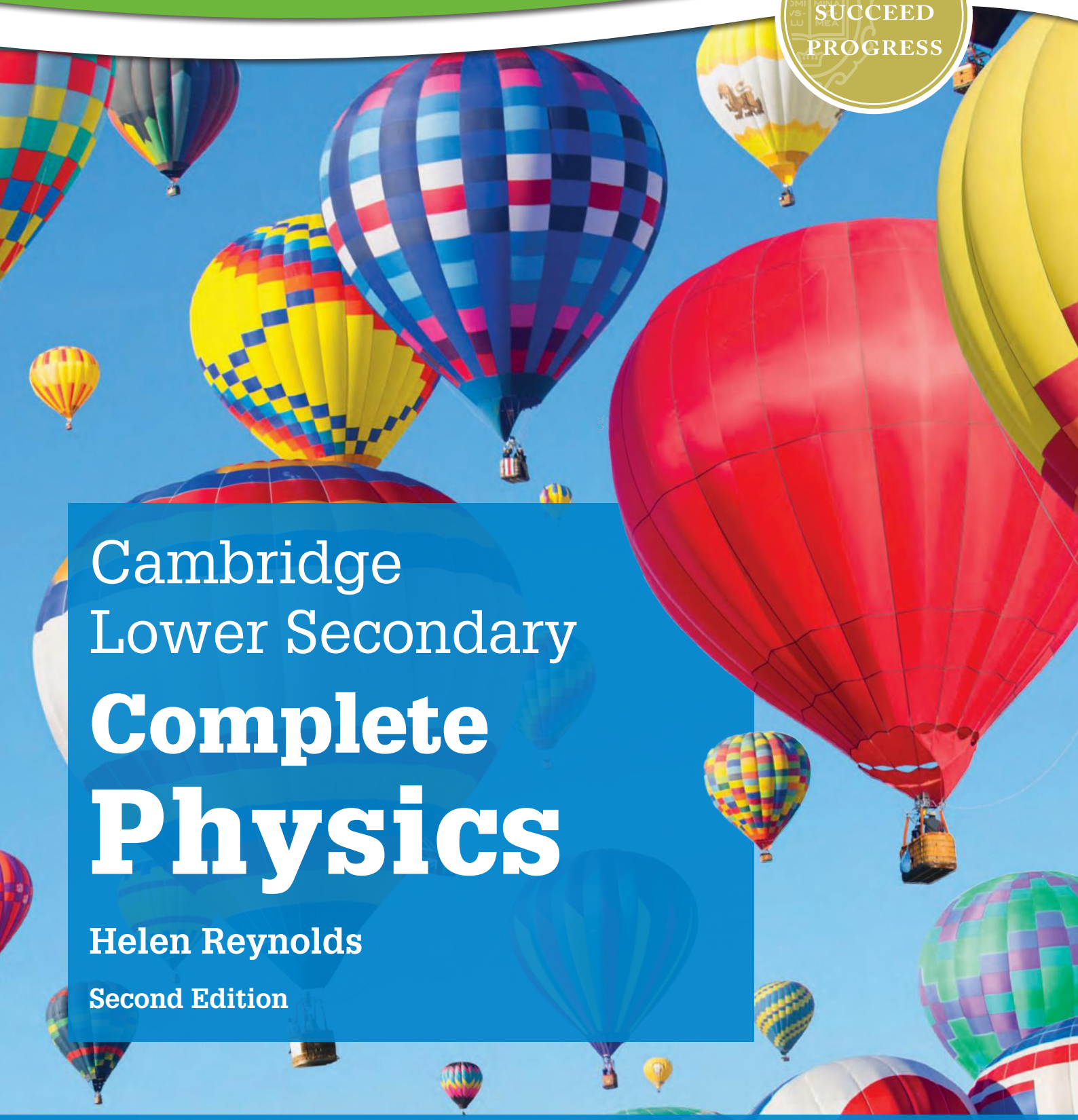
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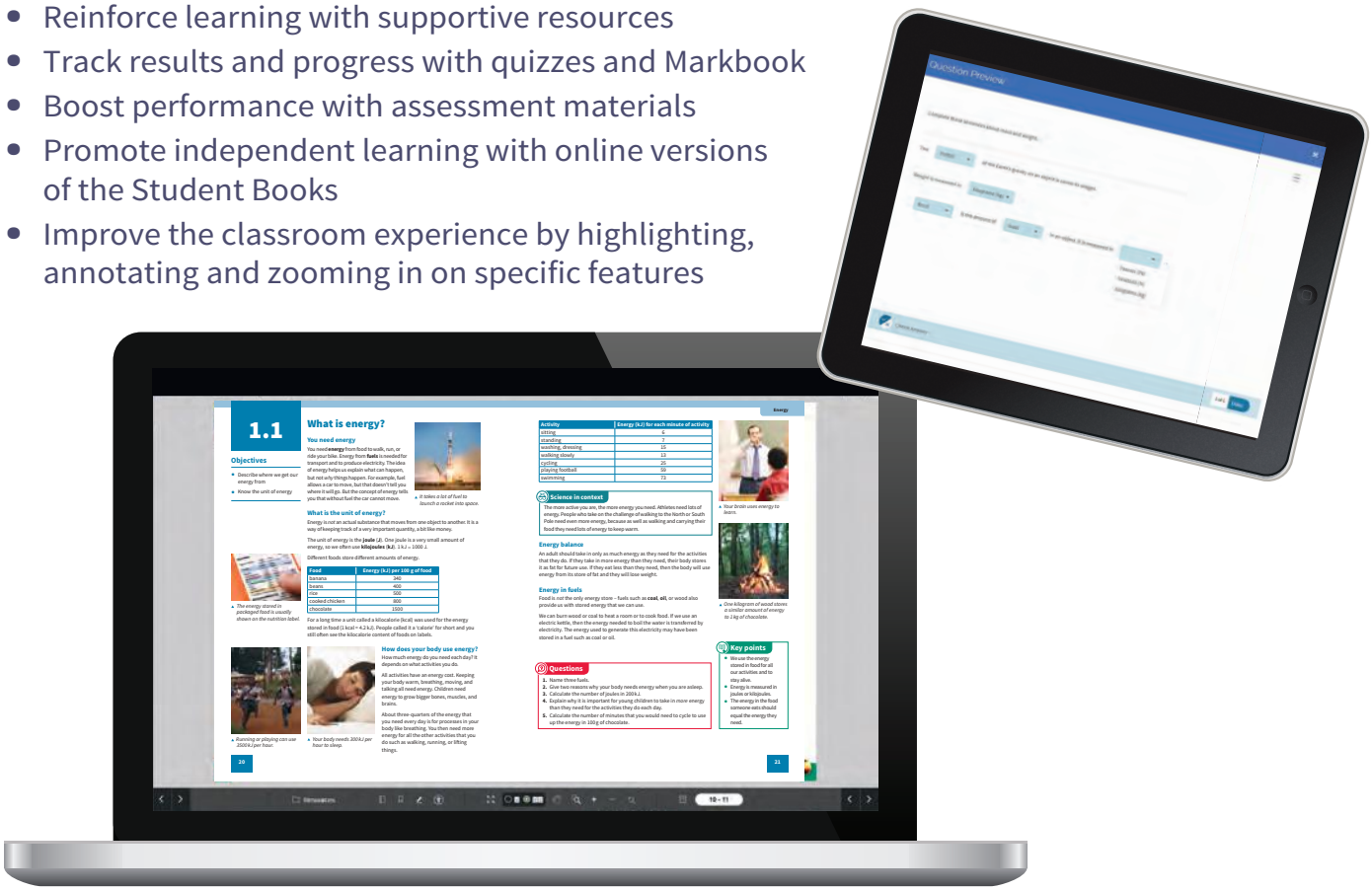
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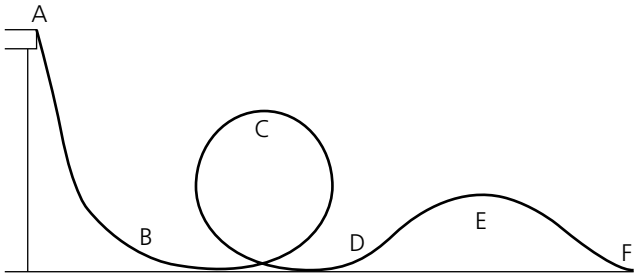
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1.5 Gravitational potential energy and kinetic energy

1. Complete the table by placing a tick (✓) in the correct column or columns for each statement.

	Gravitational potential energy	Kinetic energy
Energy that something has because of its position.		
Energy that something has because of its movement.		
This gets bigger if an object is higher off the ground.		
Is measured in joules.		
A fast-moving elephant has lots of this.		
A walking mouse has less of this than the elephant has.		

2. A student makes a track for marbles to roll down. She lets the marble go from point A.



a. At which point A, B, C, D, E, or F does the marble have the most gravitational potential energy?

.....

b. At which point A, B, C, D, E, or F does the marble have *no* gravitational potential energy?

.....

c. At which point A, B, C, D, E, or F does the marble have the *most* kinetic energy?

.....

d. Could the top of the loop (C) be higher than point A? Explain your answer.

.....

e. At point F the marble does not have the same amount of energy as it had at the start. Suggest where the energy has gone.

.....

3. A student has dropped a ball from different heights into wet sand.

a. Describe the energy changes from the point when he drops the ball to the point where the ball is in the sand and has stopped.

b. Here are some values for the gravitational potential energy and kinetic energy of the ball at different points between his hand and the floor. They are *not* in the correct order.

Point	Gravitational potential energy (J)	Kinetic energy (J)
A	0.00	1.00
B	0.75	0.25
C	1.00	0.00
D	0.25	0.75

i. Which point A, B, C, or D is the floor? .....

ii. Which point A, B, C, or D is his hand? .....

iii. At which point A, B, C, or D is the ball travelling the fastest? .....

1.6 Planning: Pendulum motion

Thinking and working scientifically

1. Here are two hypotheses. Place a tick (✓) in the final column next to the testable hypothesis.

A longer pendulum has a longer period because it has further to travel.	
A longer pendulum is better than a shorter pendulum.	

2. A student is playing with a mass that is connected to the end of a spring.

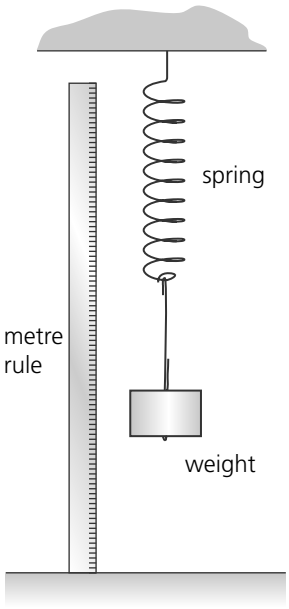
He pulls the mass down and lets it go. It goes up and down. The time it takes for the mass to go up and down is called the period. Here is his plan.

I have decided to change the mass on the end of the spring.

I will make the mass bigger and measure the time.

I will put my results in a table like this.

Mass	Time



a. Give one thing that is wrong with the table.

.....

b. Make a list of changes that he could make that would improve the data he collects.

.....

c. You have been given the following equipment:

- a box of springs of different length
- ten 100 g masses
- a stopwatch.

Plan an investigation to answer a different question from the one that the student was asking above. Write your plan in the space below.

Extension

a. Describe what you should do with your equipment before you start your investigation.

b. Write down two reasons why doing that is a good idea.

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