

Q20 and Q21 Later, O dispatches a second projectile in the direction of  $O'$  at a velocity of  $0.6c$  relative to his frame. This projectile emits microwaves at a frequency of  $10^{12}$  Hz, which are received by both observers.

KEY for Q20 and Q21

- |                        |                        |
|------------------------|------------------------|
| A $2 \times 10^{12}$   | D $6.7 \times 10^{11}$ |
| B $1.5 \times 10^{12}$ | E $5.0 \times 10^{11}$ |
| C $1.0 \times 10^{12}$ | F $3.3 \times 10^{11}$ |

Q20 Select from the key the item representing the frequency, in Hz, of the microwaves as measured by O. Pencil across *one* cell in row 20.

Q21 Select from the key the item representing the frequency, in Hz, of the microwaves as measured by  $O'$ . Pencil across *one* cell in row 21.