WALT solve angles involving parallel lines

## Success Criteria

- I can identify parallel lines and corresponding and alternate angles.
- I can use the properties of corresponding and alternate angles to find missing angles.
- I can solve problems involving angles formed by parallel lines.

Copy the diagrams

- Lines are parallel if they do not intersect.
- Parallel lines are marked with the same number of arrows.

Parallel lines Lines in the same plane that are the same distance apart and never intersect

- If two parallel lines are cut by a transversal:
- the corresponding angles are equal (4 pairs)

- the alternate angles are equal (2 pairs)

- the co-interior angles are supplementary (sum to $180^{\circ}$ ) (2 pairs).

$a+b=180$

$a+b=180$


## View the video on angles involving parallel lines

Use the information from the diagram and answer your questions

[^0] or supplementary.

2 Name the angle that is:
a corresponding to $\angle A B F$
b corresponding to $\angle B C G$
c alternate to $\angle F B C$
d alternate to $\angle C B E$
e co-interior to $\angle H C B$
f co-interior to $\angle E B C$
g vertically opposite to $\angle A B E$

h vertically opposite to $\angle H C B$
3 State whether the following marked angles are corresponding, alternate or co-interior.
a

d

b

e



4 Find the value of the pronumerals in these diagrams.

Give a reason for each answer.
a

b


Corresponding angles are equal in parallel lines. Alternate angles are equal in parallel lines. Cointerior angles in parallel lines are supplementary (add to $180^{\circ}$ ).
d

e

f

g

h



Extension

5 Find the value of the pronumerals in these diagrams, stating reasons.
a

b


C

d

e

f


Where is this used in real life?

10 A plan for a natural gas plant includes many intersecting pipe lines, some of which are parallel. Help the designers finish the plans by calculating the size of the angles marked $a, b$ etc.

1 a equal
b supplementary
c equal
2 a $\angle B C H$
b $\angle A B E$
c $\angle G C B$
d $\angle B C H$
e $\angle F B C$ f $\angle G C B$
g $\angle F B C$
h $\angle D C G$
3 a alternate
b alternate
C co-interior
d corresponding
e corresponding
f co-interior
4 a 80 (corresponding)
b 120 (corresponding)
c 131 (corresponding)
d 82 (alternate)
e 118 (alternate)
f 78 (alternate)
g 100 (co-interior)
h 129 (co-interior)
i 39 (co-interior)

5 a $a=58, b=58$ (both co-interior to $122^{\circ}$ )
b $a=141, b=141$ (both co-interior to $39^{\circ}$ )
c $a=100$ (co-interior to $80^{\circ}$ ), $b=80$ (co-interior to $a^{\circ}$ )
d $a=62$ (co-interior to $118^{\circ}$ ),
$b=119$ (co-interior to $61^{\circ}$ )
e $a=105$ (co-interior to $75^{\circ}$ ),
$b=64$ (corresponding to $64^{\circ}$ )
f $a=25$ (alternate to $25^{\circ}$ ), $b=30$ (alternate to $30^{\circ}$ )
$10 a=36, b=276, c=155, d=85$,

$$
e=130, f=155, g=15
$$


[^0]:    1 Two parallel lines are cut by a transversal. Write the missing word.
    a Corresponding angles are $\qquad$ —.
    b Co-interior angles are $\qquad$ -
    c Alternate angles are $\qquad$ -

