



Weather Basics

Depressions

Introduction



This presentation explains depressions and their effects on our weather

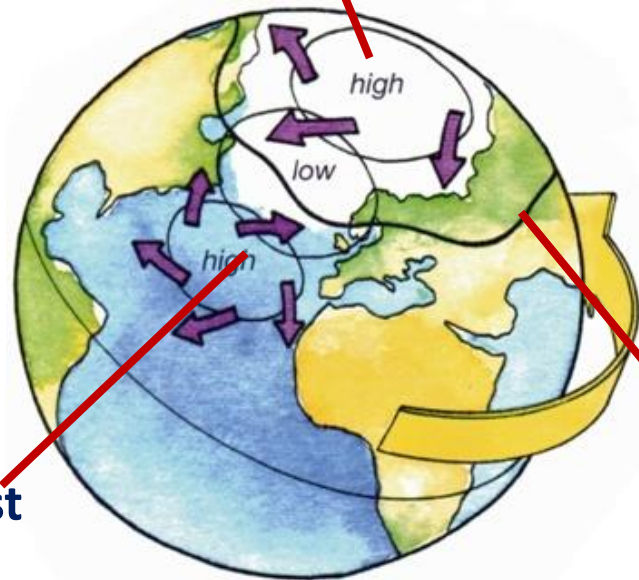


Formation of Depressions

In Northern Europe much of the weather is determined by Atlantic depressions...

cold dry
polar air

Areas of low pressure typically give strong winds and rain and often form at the Polar Front



This is the junction between cold air moving away from the pole and warm air moving away from the tropics

warm moist
tropical air

polar
front

Depressions

Early stages

Imagine the polar high and the tropical high as two clockwise turning cogs...



...clockwise turning cogs can't mesh causing friction

Depressions

Early stages



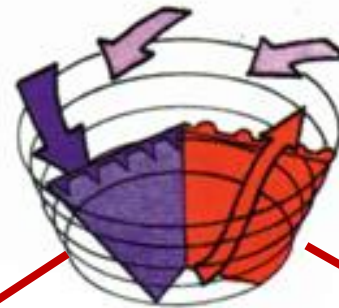
You can think of a depression as the anticlockwise cog that fits between the two

Depressions

Progression

The depression is made up from rising warm air and descending cold air...

- ...the warm air rises over the cold air
- ...the cold air forces its way beneath the warm air
- ...leading to a deepening frontal depression

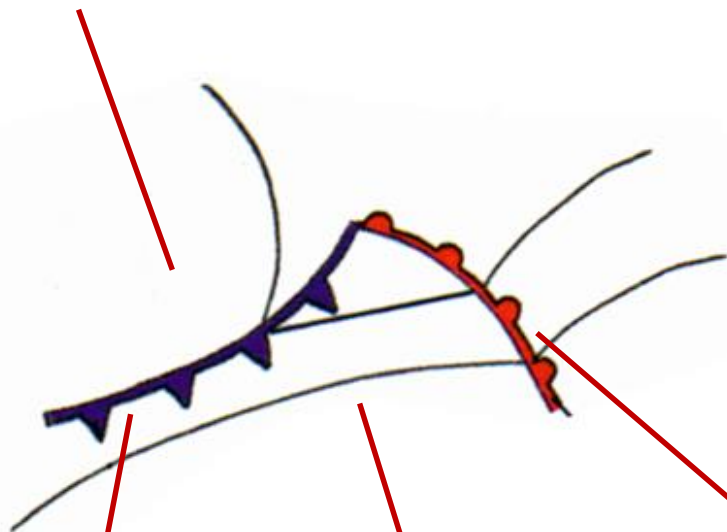


Depressions

How a depression matures

Young 'wave' depression

cold sector



warm front

cold front

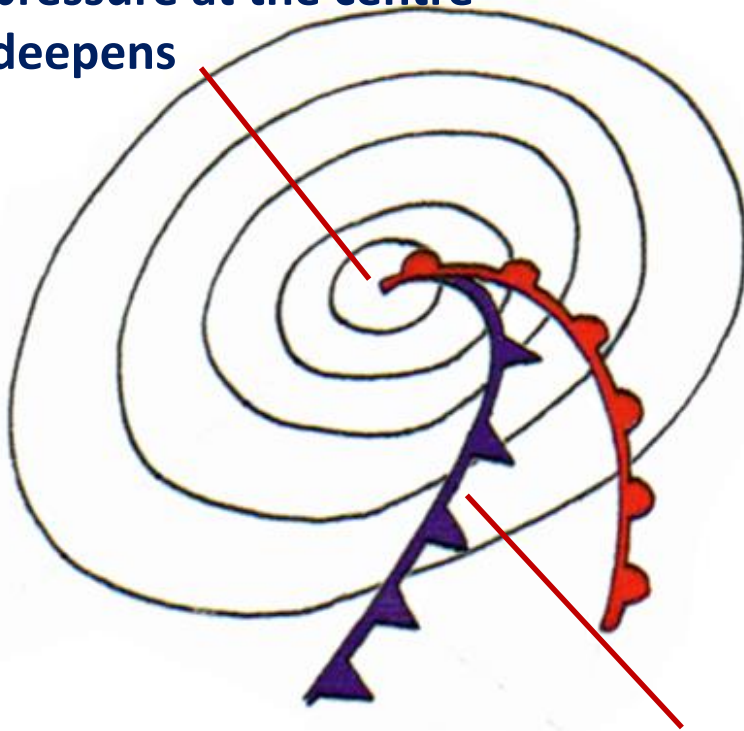
warm sector

Depressions

How a depression matures

Active deepening depression

pressure at the centre
deepens



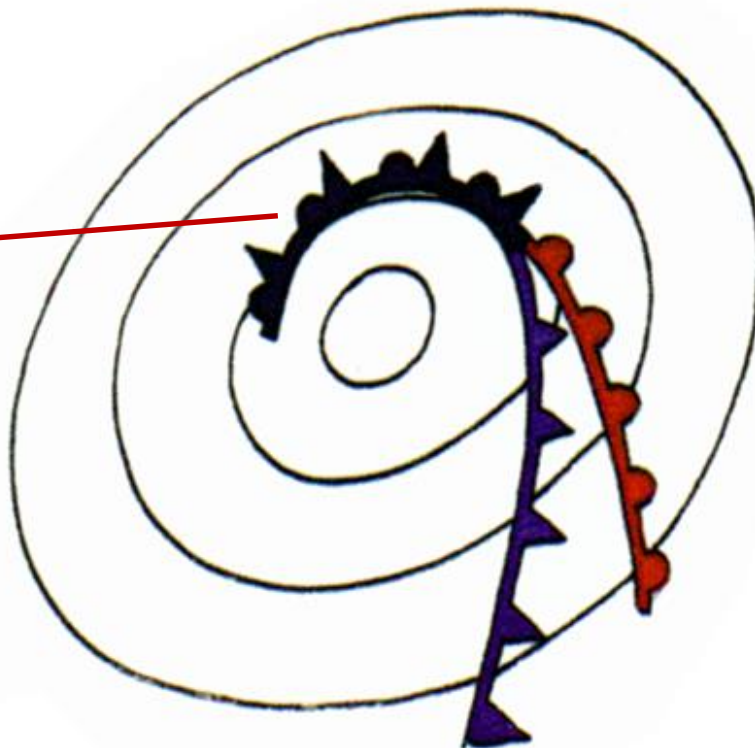
cold front starts to catch up with the warm front

Depressions

How a depression matures

Maturing depression

cold and warm fronts meet up
to form an occluded front

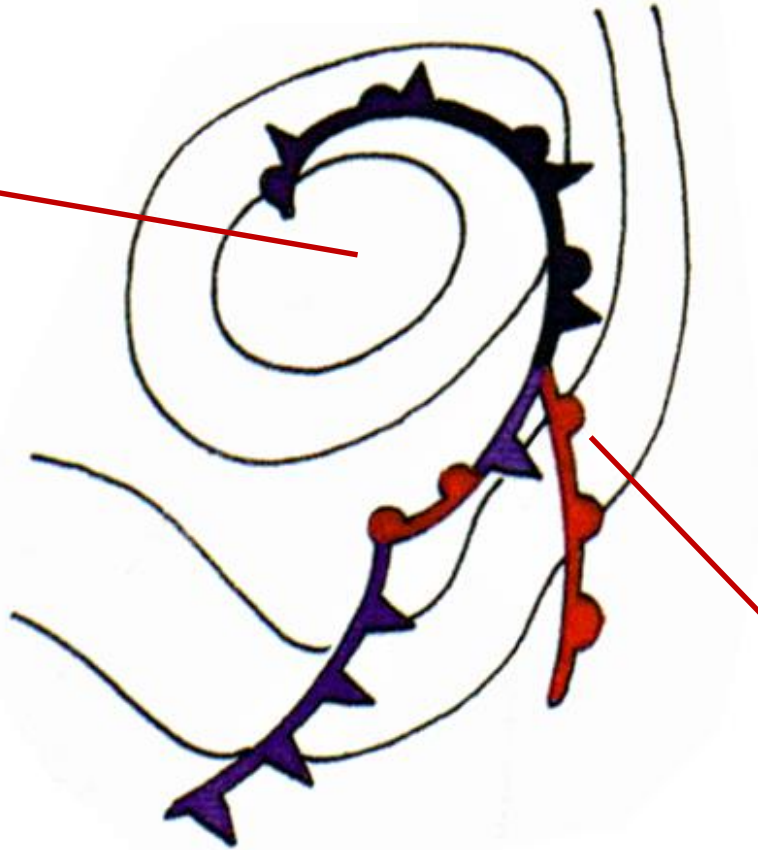


Depressions

How a depression matures

Mature depression

pressure at the
centre fills

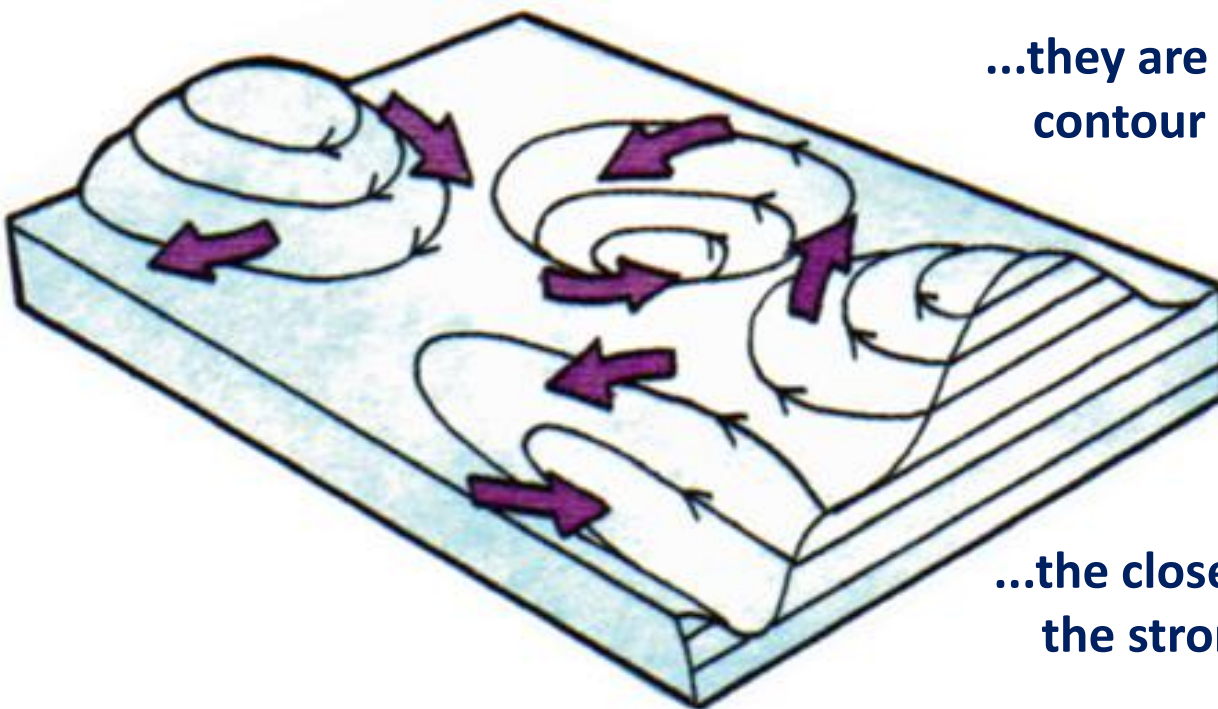


occluded front 'zips up' as
the fronts meet, the warm
air has risen above the cold
air

Depressions

Isobars and pressure

Isobars are lines of equal atmospheric pressure that are used to depict weather systems...



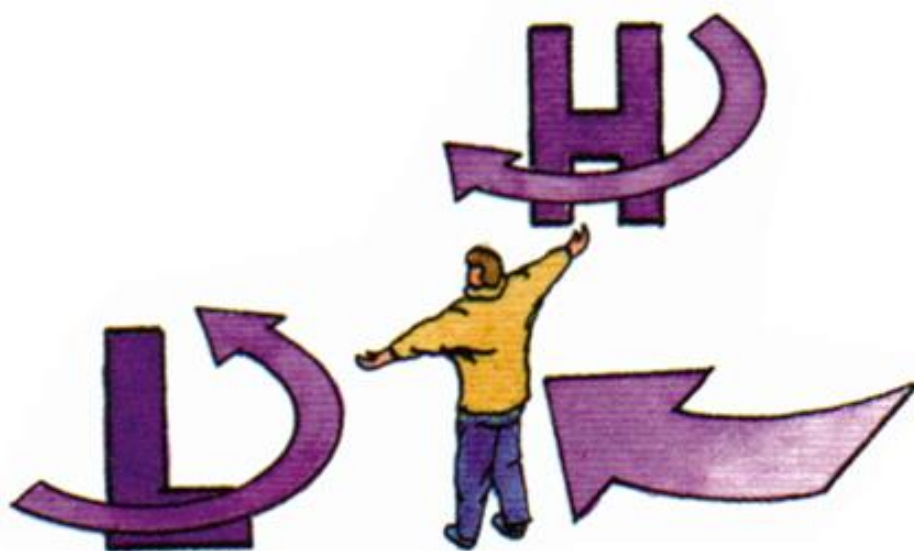
...they are used in a similar way to contour lines on land maps

...the closer together the isobars the stronger the wind

Depressions

Buys Ballot's law

In the Northern Hemisphere if you stand with your back to the wind...

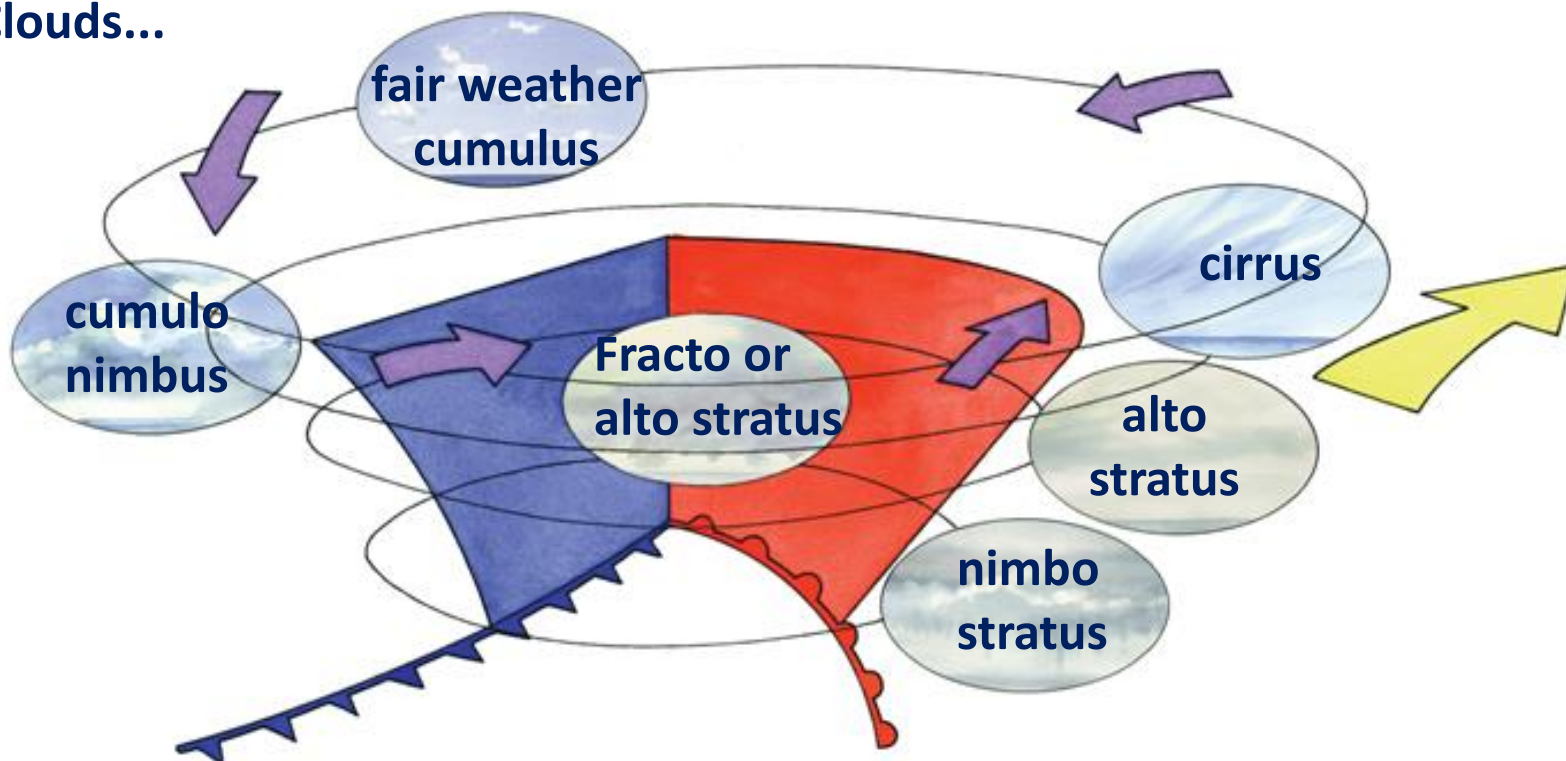


...low pressure will be on your left hand side
and high pressure on your right

Depressions

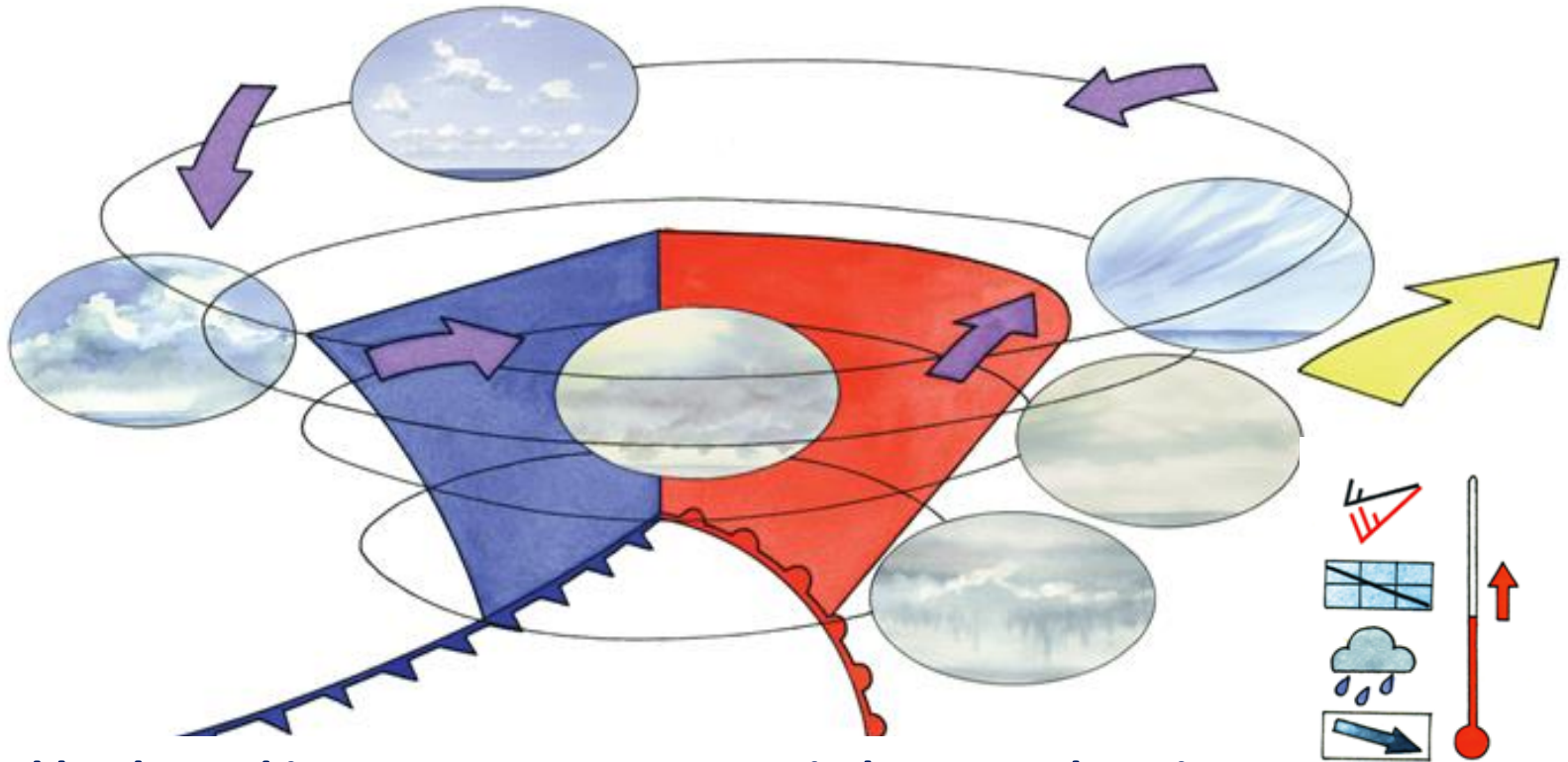
Features of a typical depression

Clouds...



Depressions

Warm front approaching



1. wind backs and increases

2. pressure falls

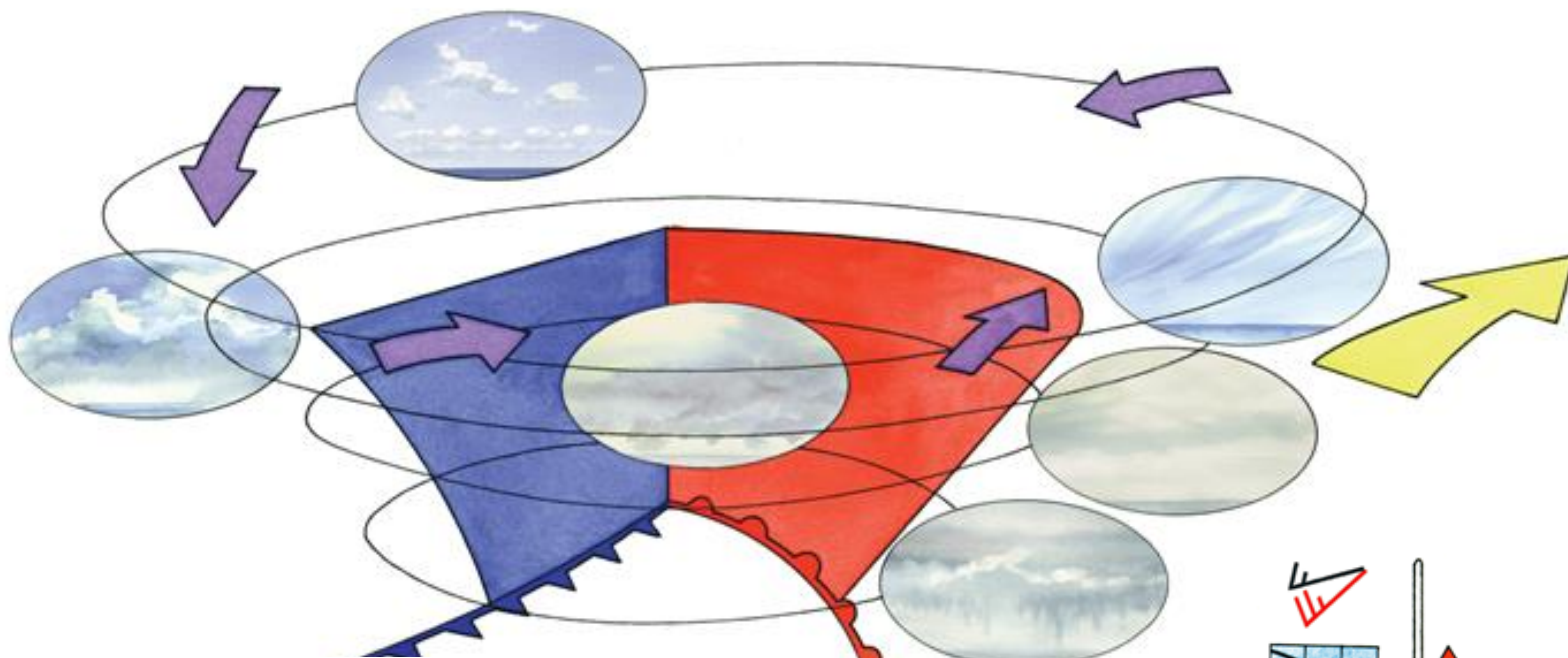
3. cloud base descends and thickens

4. rain becomes heavier

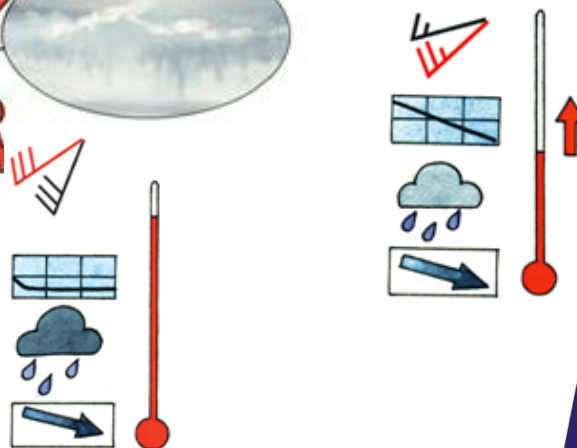
5. visibility deteriorates in rain

Depressions

Warm front passes...



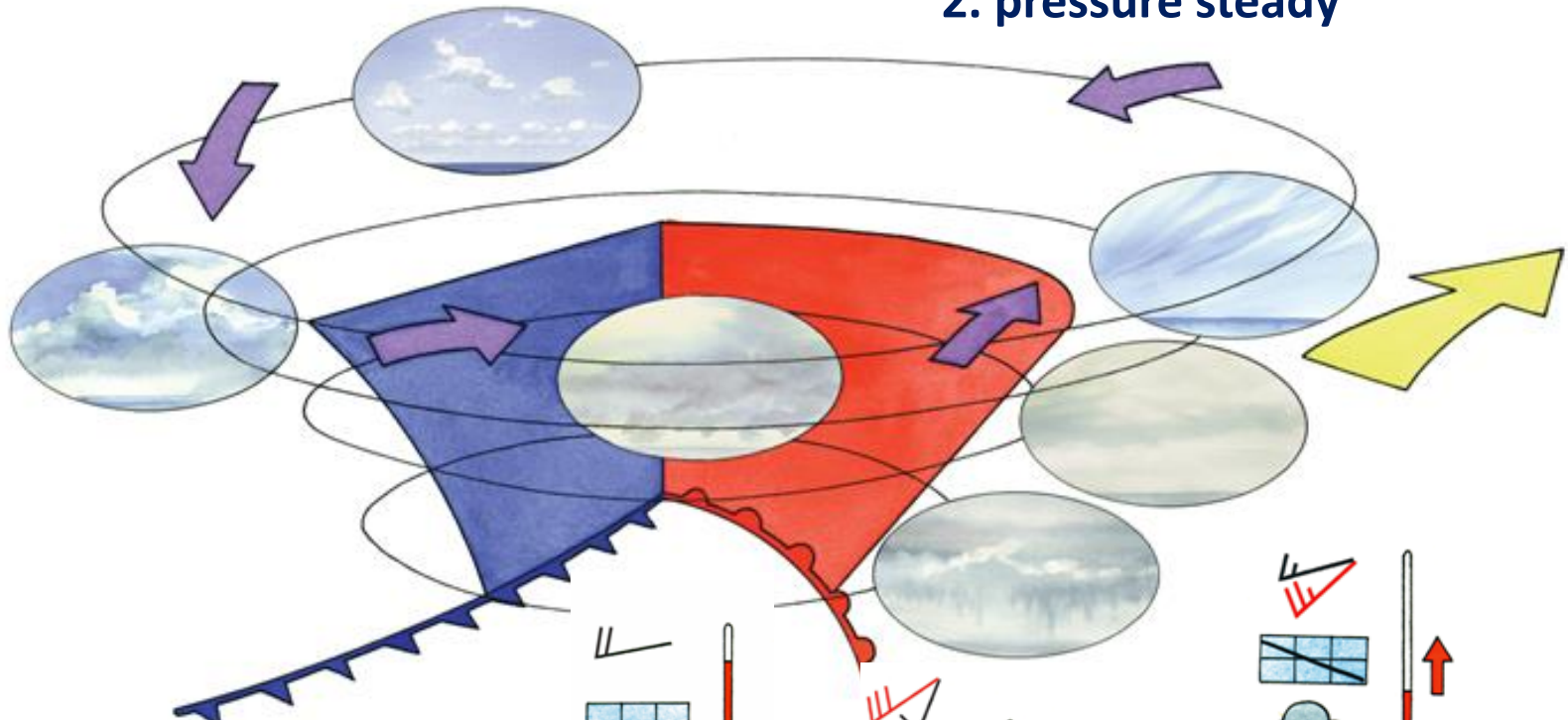
1. wind veers
2. pressure stops falling
3. humidity increases
4. rain turns to drizzle
5. visibility poor



Depressions

In the warm sector

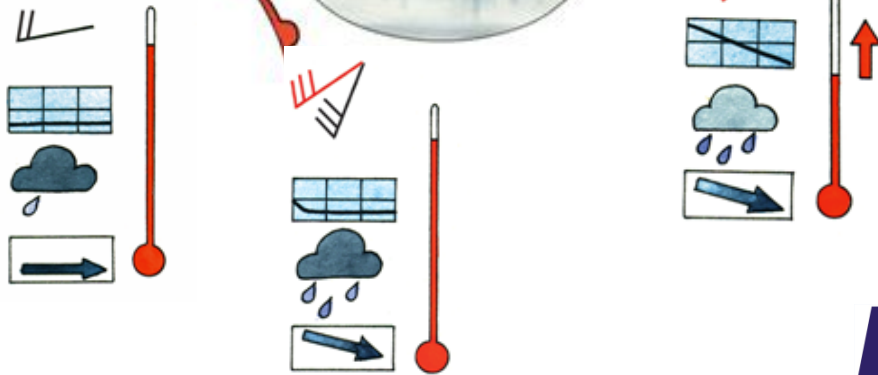
1. wind direction steady
2. pressure steady



3. humid

4. patchy drizzle or light rain

5. visibility moderate or poor

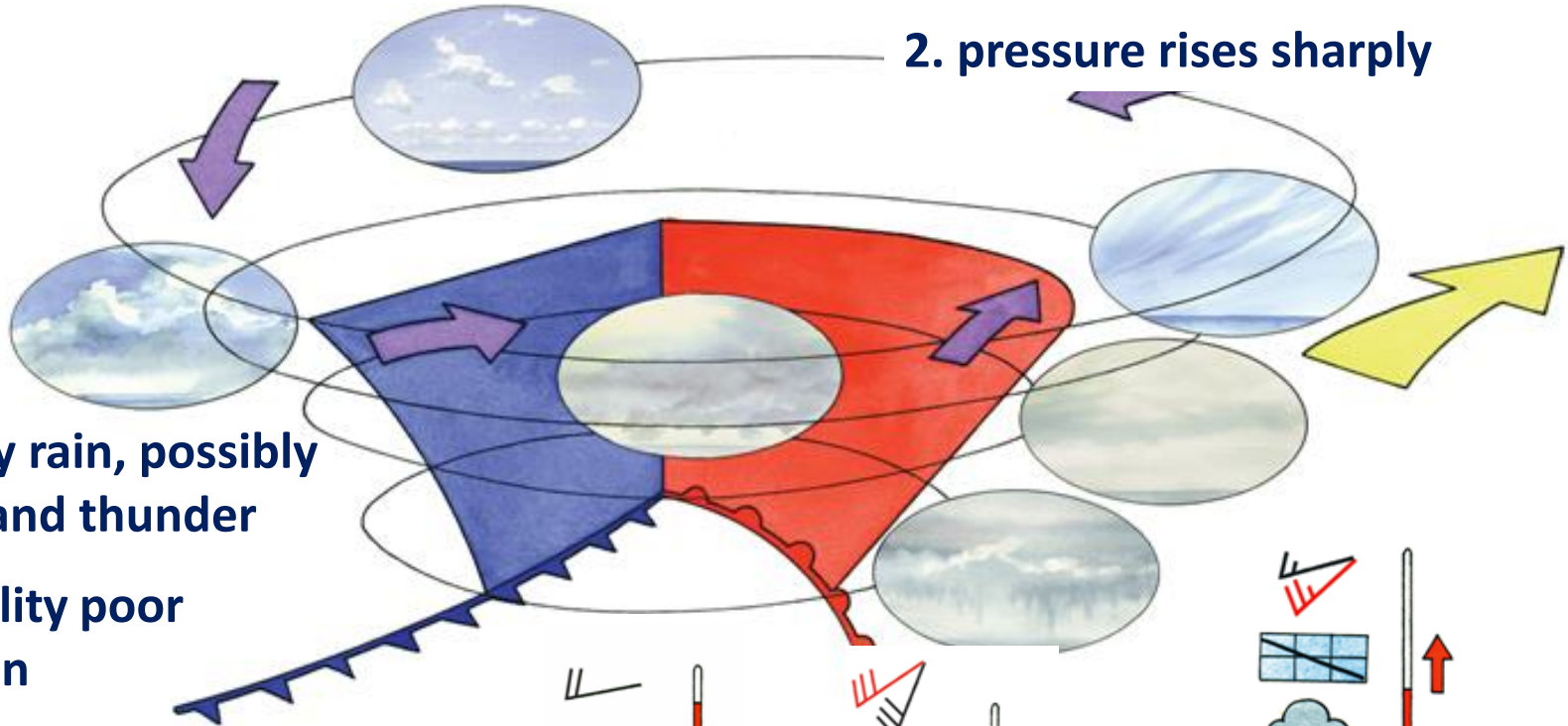


Depressions

Cold front passes

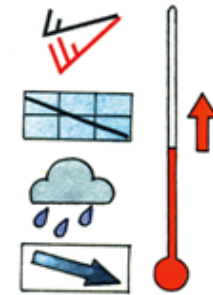
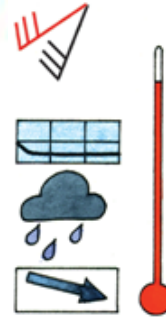
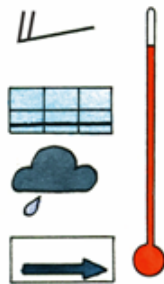
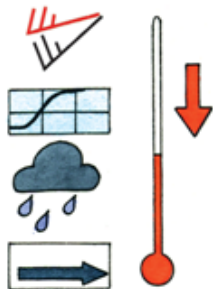
1. wind veers suddenly often with squalls

2. pressure rises sharply



3. heavy rain, possibly hail and thunder

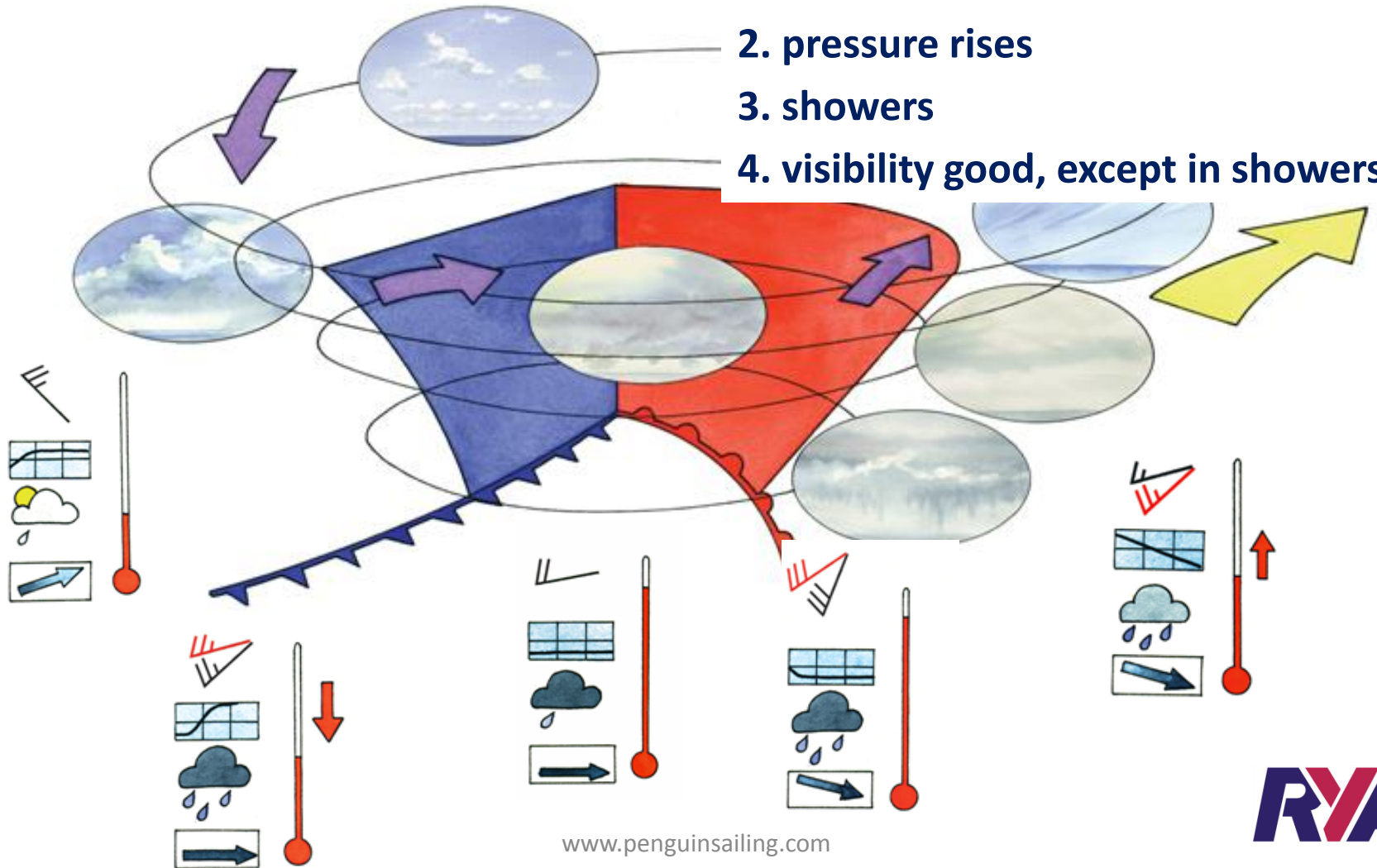
4. visibility poor in rain



Depressions

Behind the cold front...

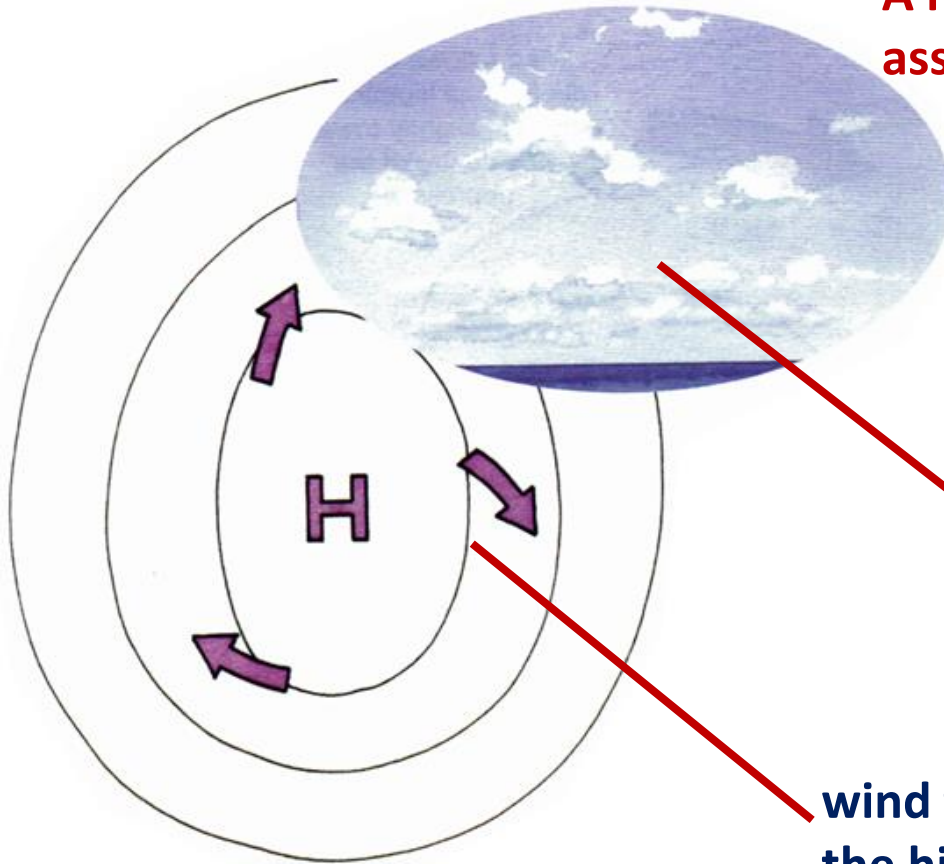
1. wind gusty
2. pressure rises
3. showers
4. visibility good, except in showers



Depressions

Anticyclones

A high pressure system is usually associated with fine settled weather



typical cloud, fair weather cumulus

wind flows clockwise around the high, away from its centre

Further Reading



We highly recommend Chris Tibbs's
RYA Weather Handbook (G1)



We highly recommend David Haughton's
RYA Weather Forecasts(G5)

You can buy a copies of these books by visiting our on-line shop at
www.penguinsailing.com