

Edexcel IGCSE

Changing Nature of Warfare c. 1919 - 2011

- . Nature of warfare in the 1930s
- . Changing methods of land warfare
- . Changing methods of seas & aerial warfare
- . The development of atomic & nuclear weapons
- . Warfare at the beginning of the twenty-first century





IGCSE

Edexcel

Paper 2:

The changing nature of warfare: c.1936 - c.2003
B7

Study in Breadth

Warfare

. Nature of warfare in the 1930s

- . Methods including: gas, tanks & heavy artillery
- . Emergence of submarines & military aircraft

. Changing methods of land warfare

- . Blitzkrieg tactics: Poland, Western Europe & USSR
- . Amphibious landings at D-Day
- . Allied advance 1944 - 45 inc. Battle of the Bulge & Arnhem
- . Arab-Israeli conflicts & First Gulf War
- . Guerilla warfare inc. Vietnam & Afghanistan

. Changing methods of sea & aerial warfare

- . Battle of the Atlantic & U-boats
- . Development of the aircraft carrier inc. Pacific 1941-45 & Falklands war
- . Nuclear submarines
- . Aircraft in WWII inc. Battle of Britain, the Blitz, V rockets, & allied bombing of Germany,

. Development of atomic and nuclear weapons

- . Use of atomic bombs in Japan
- . Nuclear arms race 1945 - 90, MAD theory & arms limitation
- . Developments of other weapons of mass destruction

. Warfare at the beginning of the C20th

- . Importance of conventional warfare
- . Impact of terrorism inc. 9/11
- . High tech warfare

Changing nature of
Warfare
Glossary

1

Glossary for WWI warfare

France



No Man's Land



trenches



Britain



Germany



barbed wire

Land

Artillery large guns firing shells**Barbed wire** wire with barbed spikes (placed in 'No Man's Land')**'No Man's Land'** land between the two lines of trenches**Trenches** ditches dug out of the ground for defence

Q-boat

Blockade stopping supplies getting into a city or country (blockade of Germany in WWI)**Submerge** go underwater (submarine)**Merchant ships** non military ships carrying cargo and supplies**Depth charges** explosives used to blow up submarines (rolled off the back of ships)**Hydrophones** underwater listening device (to find U-boats)**Convoy** a group of ships travelling together**Torpedo** 'missile' shot by submarines**U-boats** name for German submarines**Q-boats** name for boats that look like merchant ships, but were armed

Sea

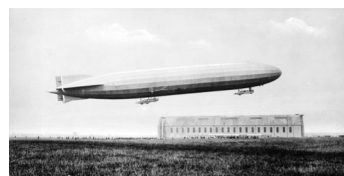


convoys



German U-boat

Air

Zeppelins German airships (bombed London)**Reconnaissance** looking (observing & photographing) from planes in WWIreconnaissance
photography

Zeppelin airship

Changing nature of
Warfare

The nature of warfare in World War One

**World War I**

1.1

Situation on land**Trench warfare**

Both sides dug trenches which were well defended with barbed wire & machine guns, making it very difficult to get a breakthrough. They developed three ways to overcome the problem:

GAS**ARTILLERY****TANKS**

barbed wire made
infantry attack very
difficult

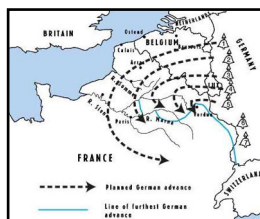


trenches made very effective
defences



machine guns could easily defend the
trenches against infantry attack

1.2

Land Warfare in WWI**Schlieffen Plan**

1.3

Germany's Schlieffen Plan

The Schlieffen Plan was first devised in 1897 - based on a weak France and a strong Russia (who would take time to mobilise its army.) Germany's plan never worked: Belgium fought back, and Britain came to the defence of Belgium (something Germany did not expect). Russia mobilised in ten days so German soldiers had to go East to fight. So the Germans were stopped and trench warfare began.



| Tactic / method | How it worked | Success / Failure |
|------------------|--|--|
| Artillery | <p>Fired on trenches before an attack Guided by observation until they hit the target</p> <p>'Creeping barrage': firing just in front of soldiers attacking Aircraft helped with accurate firing</p> | <p>F: Poor quality shells not always explode Wrong type of shells not destroy barbed wire. No surprise: when artillery stopped, attack would start, soldiers out of trenches with machine guns firing Go underground to escape artillery</p> <p>S: Concentrate artillery More surprise</p> |
| Gas | Gas shells fired at enemy | <p>S: Soldiers very afraid of gas attacks F: Relied on the wind (which could change direction) Gas masks = more people survived Only 3,000 British killed through gas attacks Mustard gas killed more than chlorine</p> |
| Tanks | <p>Tanks able to cross 'no-man's-land' & the barbed wire</p> <p>Soldiers go behind & have some protection</p> | <p>S: Some success once tactics improved Battle of Cambrai first tank attack Much potential</p> <p>F: Germans had armour piercing shells Very slow & unreliable</p> |

Artillery

Railway howitzer 1916
12 inch gun
range: 12,000 metres

Gas

Gas used the wind to
blow towards the
enemy trenches

Tanks

British Big Willie tank in 1916

Changing nature of Warfare

The nature of warfare in World War One



World War I

1.4

Situation at sea

Blockade of Germany

The British navy blockaded Germany to stop supplies getting into the country.

The blockade caused:

- . between 450-750,000 deaths
- . food shortages led to riots
- . rationing
- . malnutrition leading to a range of illnesses & diseases

Sea battles

Battle of Jutland 1916

German navy tried to break out from the blockade resulting in the Battle of Jutland in May. British suffered large losses but the German navy went back to port & stayed there for the rest of the war. It was the only sea battle.



Q-boat



Convoy system

1.5 Sea Warfare in WWI

U-boats



German U boat (US library of Congress)

Successes

Merchant ships sunk = 5,000 (12 million tons) Sailors killed = 15,000

War ships sunk = 104 Damaged = 42 Sailors killed = 5,000

Q ships sunk = 61

Britain had only 6 weeks of supplies at one point in the war

Advantages

- . **Submerge:** not be seen or found or if found not be attacked underwater
- . **Torpedo:** one hit could sink a ship

Disadvantages

- . **Surface:** had to surface regularly
- . **Slow:** only go 15 knots on the surface, so easily caught

1.6 Anti U-boat tactics after 1915

| Tactic / method | How it worked | Success / Failure |
|--|---|--|
| Q-boats 1915 | Looked like a normal merchant ship but had guns on board. When U-boat came to the surface it fired | 14 U-boats sank U-boats stopped surfacing (27 Q-boats sank out of 200) |
| Defensive tactics 1915 | Merchant ships to turn towards the U-boat to ram it | Caused U-boats to submerge & not attack |
| Offensive system 1915 | Laid nets & mines around U-boat bases Had submarines waiting for the U-boats outside their bases | Little success, only 2 U-boats sunk |
| Depth charges 1916 | Depth charges rolled down a chute off the back (stern) of a boat | Only 3 U-boats sunk But feared by U-boats |
| Hydrophones 1916 | Listening device to hear U-boats underwater | Quite good in a convoy system, but not always find U-boats |
| Convoy system 1917 | Merchant ships stay together guarded by British navy ships using hydrophone & depth chargers | Very successful, reduced number of ships being attacked. U-boats looked for non convoy ships to attack |
| Attacks on U-boat bases 1918 | British sank boats outside their bases to block in the U-boats at Ostend & Zeebrugge | Harbours not completely blocked so U-boats could still go in and out. |

Changing nature of
Warfare

The nature of warfare in World War One



1

World War I

1.7

Air warfare

Start of WWI planes very basic
only good for reconnaissance,
then develop fighter & bomber
planes



A Zeppelin over London (CH4)



Aerial photography (IWM)



German fighter planes 1917 (IWM)



German Gotha bomber plane 1917

1.8

Air Warfare in World War One**Air warfare**

British Sopworth Camel (Bettman/Corbis)

Successes

Reconnaissance = photos of enemy positions

Fighter aircraft = machine guns shoot other planes

Bomber planes = not effective, but showed potential

**Advantages**

- . **Aerial view:** excellent reconnaissance
- . **Machine guns:** shooting through the propellor turns the plane into a weapon

Disadvantages

- . **Slow:** planes still slow easily shot down
- . **Not powerful:** not able to carry many bombs

1.9

Air Warfare in WWI

| Plane | How it worked | Success |
|-----------------------|---|--|
| Zeppelins | Able to fly to London & drop bombs | Scared people BUT: not carry enough bombs hydrogen easily catch fire Britain had to keep fighter planes in England rather than send to France |
| Reconnaissance | Planes first used to view enemy trenches, artillery spotting, following the pattern of battles Developed cameras to take pictures of enemy positions | Successful but had limitations Not able to communicate with soldiers on the ground Photographs very useful for planning |
| Bomber planes | Germany: 38 Gothas bombed London Britain: Handley Page could fly to Berlin | Limited success as lost 6 Showed potential Developed too late to be used |
| Fighter planes | Planes started to shoot at each other. Invention of machine gun firing through propeller made a big difference French had rockets to fire at balloons | Attacked 'spotting' balloons Attacked bombers & other fighter planes Allied planes lost: 88,000 Germany planes lost: 28,000 |

Warfare

The nature of warfare in World War One



2

Glossary for Land Warfare WWII



France



No Man's Land



trenches



Britain



Germany



barbed wire



Q-boat



convoys



German U-boat

reconnaissance
photography**Motorised transport** various vehicles to move soldiers**Out flanked** forces come from the side to attack**Reinforcements** extra troops join the battle, after the first attack**'Maginot Line'** line of concrete defences built by the French to protect themselves from a German attack**Panzer tanks** type of German tank, very strong and heavily armed, feared by others**'Scorched earth'** destroying everything often by burning it, leaving a waste land**'Atlantic Wall'** lines of German defences along Northern French coast to defend against possible invasion from Britain/USA

Land

Luftwaffe German airforce**RAF** British airforce**Air superiority** name for having control of the air over the enemy

Air

Mulberries floating harbours used in Normandy by Britain & USA**Amphibious** go on land and water e.g. DUKW (Duck vehicle)**Bombardment** long and heavy firing at targets (used at D-Day by navy ships)

Sea



USSR



USA



Poland



Netherlands



Belgium



2

2.1

WWI

Germans had tried this to some extent in WWI, concentrating attacks on key points rather than on long fronts.

**Poland 1939****1 September**

Polish airfields bombed & airforce destroyed

3 September

Polish defences broken

8 September

Danzig port captured

(17 September)

(USSR attacked from the East)

28 September

Warsaw surrendered

**German Stukas**

Dive bombers attack behind enemy lines - airfields & communication facilities

Land Warfare in WW2

Fighting on land became more mobile - the German Blitzkrieg

2.2

Blitzkrieg 1939 - 40

Poland, Holland, Belgium & France

Blitzkrieg tactics

Blitzkrieg
'Lightning war'
- be over quickly using huge motorised forces; land & air

Airpower
Surprise attacks on airfields & communications facilities

Attack weak spots
Large attacks on the enemy's weak points

Reinforcements
Reinforcements arrive quickly to secure land taken before a counter attack

Organised
Co-ordinated attacks using radios

Concentrated attacks
Everything thrown into the attacks: tanks, dive bombers (Stukas), & soldiers in motorised transport

2.3

**Latest technology**

. German's recent rearmament meant they had the latest weapons e.g. Stukas & Panzer tanks

Polish military

. out dated technology
no match for the Germans

USSR attacks

. USSR attacked from the East leaving Poland fighting on two fronts

Reasons for German Blitzkrieg success**Not support**

. had alliances with Britain & France but neither helped

Weak defences

. defences not cover all the 500 mile border with German

Surprise attacks

. Poland not prepared
. much of the air force destroyed on the ground

Consequences:**Poland divided between Germany & USSR**

. 65,000 killed, 600,000 + taken prisoner
. 140,000 soldiers escaped, & headed to Britain to fight against the Nazis

2

2.4

**Holland, Belgium
France 1940****10 May**Germany invades
Holland & Belgium**12 May**Germany attacks France
through the Ardennes woods**14 May**

Rotterdam bombed

15 May

Holland surrendered

20 MayBritish & French
soldiers surrounded
at Dunkirk**28 May**

Belgium surrendered

21 June

France surrendered

**German Tanks**Panzer tanks were powerful and
mobile

2.5

Blitzkrieg 1939 - 40

Poland, Holland, Belgium & France

Holland, Belgium & France**Lack of preparation**French & British did little to prepare for
attack after Poland. Over reliant on the
Magenot Line defences - which the
Germans simply went around.**Overwhelmed**. Belgium & Holland could not
cope with high intensity attacks**Reasons
for
German Blitzkrieg
success****Bombing**. Bombing of
Rotterdam quickly
persuaded the
Dutch govt. to
surrender**Lessons not learnt**. The Germans outflanked the British &
French because of their speed of attack.
Lessons not learnt from Poland.**Weak point**. Ardennes woods was
poorly defended because
the French thought tanks
would not get through.**Dunkirk:** British & French soldiers retreated
to French port of Dunkirk - surrounded by
Germans.Royal Navy launched a rescue operation on
27 May - 4 June - small boats took 338,226 off
the beaches to waiting Navy ships.

2.6

Hitler ordered German tanks not to attack,
thinking Luftwaffe would do the job.RAF attacked the Luftwaffe protecting the
soldiers on the beaches.All the British equipment was left behind.
Britain turned the disaster into a 'victory'.**Mobile troops**Troops moved quickly
in a variety of vehicles



2

Land Warfare in WW2

Fighting on land became more mobile - the German Blitzkrieg

2.7

Blitzkriegin the
USSR

1941 - 42

North Leningrad Centre Moscow South Stalingrad

Germany invaded the USSR

June 1941

Soviet troops retreated
as **Blitzkrieg** was successful**BUT**By November 1941 Blitzkrieg
was halted.Cities not captured:
Leningrad, Moscow & Stalingrad**Germans attacked**again in
spring of 1942
at Stalingrad heading to the
oilfields of Baku**Battle of Stalingrad**turning point in the war on the
Eastern FrontGermany lost 1 million men in
trying to capture the city**Soviet war production**increased after 1942
now producing tanks, planes etc
faster than Germany

2.8

Blitzkrieg 1941**USSR****Invasion - June 1941**

- . Excellent planning & preparation
- . Tactics used in Western Europe
- . Experienced troops

. German forces made huge
gains, killing hundreds of
thousands of Soviet soldiers
and taking many prisoners
BUT
they refused to give up

Success**Surprise attack**

- . Red Army not prepared
- . Lack of experienced officers
due to 1930s purges
- . Luftwaffe controlled the air

. Stalin ordered his
commanders not to retreat

**German
Blitzkrieg 1941****Russian winter**

- . Early start to winter slowed
Germans on already bad
roads
- . Temps down to -30°C &
Germans poorly equipped

Failure**Attack too late**

- . delayed because
Hitler was helping
Mussolini

Three pronged attack

- . divided German forces

2.9

Hitler diverted Panzer tanks from
the attack on Moscow to help in
the south. When they returned
heavy rain in October 1941 made
progress impossible

Stalin's scorched earth

- . fast retreat & destroyed &
burnt (scorched) everything as
they went, leaving nothing for
the Germans

Stalin knew the difficulties the
Germans had in supplying huge armies
of 3 million, so destroying everything
made it more difficult for the Germans,
who had expected to 'live off the land'



2

2.10

D-Day
5 . 6 June**Air:****Paratroopers & Gliders**

night of 5th & 6th June
landed behind enemy
lines to destroy German
communications
& secure bridges
11,000 aircraft
provided cover for the
invasion on 6th June & after ...

Sea:**Naval Bombardment**

British ships started firing on
German positions at 05:30

Land:**Invasion**

156,000 troops landed
on 5 beaches:
British/Canadian
(Gold, Juno & Sword)

USA

(Utah & Omaha)



D-Day got large force into
France very quickly - helped
by capturing the port at
Cherbourg.

Battle of Falaise

Big loss for German 7th
army & 5th Panzer army:
10,000 killed & 50,000
prisoners.
Major blow to German
morale.

2.11

D-Day June 1944

Normandy Northern France

Resistance;
People who
helped the
British in France

Planning

Aerial photos of the area & beaches
French resistance gave information

Air superiority

Luftwaffe attacked to make
sure they had air
superiority

Training

US/Canadian troops went
to Britain to train for the
invasion

Planning**Secrecy**

Total secrecy about
location of invasion

Technology

developed & used:

- . Mulberries (floating harbours)
- . Landing craft (flat bottomed boats to get on beaches)
- . Fuel pipeline (PLUTO bring oil from Britain)
- . Tanks (specially adapted: waterproof, anti mine)

2.12

Reasons for success**German response**

to the invasion was slow
- they thought the main
attack was to be at Calais.
Hitler held back elite
troops.

Good leadership

from Eisenhower & teamwork getting many countries together.

Invasion**'Atlantic Wall'**

the German defence
along French coast not
complete & not strong
in Normandy.

Surprise

Allies went to great lengths to keep the invasion a secret:
. ghost army near Dover
. double agents giving false information - saying invasion at Calais
. bombed Calais to trick Germans into thinking invasion was there

Consequences

opened a
'Western Front'
Germany fighting on
'Eastern' & 'Western'
fronts, dividing forces.
Stalin been pressurising
for second front.

Two events slowed advance on Germany:

Battle of the Bulge

(Dec. 1944)

Hitler launched surprise
counter attack in Ardennes.
Took several weeks to regain
ground lost, but Germans had
100,000 casualties.
Used most of their reserve
men & equipment.

Operation Arnhem

(Sept. 1944)

Paratroopers dropped to take
two bridges over the Rhine -
failed to take bridges.
British General Montgomery
was blamed.

2.13

Paris liberated

on 25 August,
then headed
towards Berlin.

Changing nature of
Warfare
Changing methods of land warfare



2

2.14



Landing craft

Flat bottomed boats allowed troops to get close to the beach.



Mulberry harbours

Allowed vehicles & supplies to be unloaded from large ships



Tanks - anti-mine

Tanks exploded mines on the beach



Tanks - floating

US Sherman tanks fitted with propellers



Tanks - fake tank, part of the 'Ghost army'

Position in Kent, to trick the Germans into thinking the invasion would be around Calais.



US DUKW (Duck)

Amphibious vehicle



Changing nature of
Warfare
Glossary

2

Glossary for Land Warfare after 1945

Iraq



Mujahdeen fighters



Mountainous terrain



Britain



USA

'Search & destroy' in
Vietnam**Coalition** group of countries fighting together**Mujahdeen** Islamic guerilla fighters in Afghanistan**Sabotage** destroying something e.g. power lines, pipelines etc**Reconnaissance** looking over an area, location etc**Artillery** large guns, cannon etc**Bombardment** artillery firing for long time**Terrain** the land e.g. mountains, jungle, forest etc**Morale** self esteem, enthusiasm of people**Booby traps** traps for soldiers (fall into a spiked pit etc) often set-off by a wire**Guerrilla** type of fighting - hit and run, small groups, rather than large armies

Booby traps in Vietnam

**Air superiority** Control of the air (usually having destroyed the other airforce)**Search and destroy** Tactic used by US in Vietnam: helicopters bring in soldiers they attack (a village) and leave

USSR



Israel



Egypt



Kuwait



Afghanistan

Vietnam
(North)Vietnam
(South)

2

2.15

Arab-Israeli Wars**1948: Israel declares itself a country**

- . Conflict between Israel & Arab countries over land

1956: Nasser - Egyptian President

- . Pro Arab nationalism
- . Hostile towards Israel

1956: Suez Crisis

- . Conflict over Suez Canal between Nasser v Britain, France & Israel
- . Israel occupied large areas of Egyptian land
- . UN intervened & Israeli forces withdrew
- . France & Britain embarrassed
- . Egyptian forces defeated but Nasser turned it into an Arab victory.
- . Israel showed its military power

United Nations:

- . Israel gained access to Suez canal
- . UN force stayed in the Sinai to keep Egypt & Israel apart

Peace Treaty:

- . 1976 Israel & Egypt signed peace treaty ending 30 years of war

Continuing conflicts:

- . 1982: Israel invaded Lebanon
- . Withdrew by 1985
- . Gaza Strip & West Bank conflicts
- . Oslo Accords 1993
- . Intifadah after 2000

Developments in land warfare 1945 - 2003**Arab-Israeli Wars**

2.16

Six Day War 1967**5 June**

Israeli planes destroyed Egyptian aircraft on the ground

5 . 6 June

Israeli air force also destroyed the airforces of Syria & Jordan

7 June

Israeli tanks with air support destroyed Egyptian forces in the Sinai

10 June

Israel took the Golan Heights.

Surprise - feared Egyptian attack, so struck first without warning

Air superiority for Israel

Reasons for Israeli success

Tank tactics ensured victory in the desert against large Arab armies

Modern technology supplied to Israel by the USA

2.17

Yom Kippour War 1973**6 October**

Surprise attack by Egyptian & Syrian forces in Sinai & Golan Heights. Israeli forces suffered huge casualties.

8 October

Israeli forces counter attacked, getting 65 miles from Cairo.

24 October

Cease-fire organised by the UN

1975

Israel & Egypt signed peace agreement.

Regrouped Israeli forces quickly recovered after surprise

Modern technology Israel had superior tanks & air power

Reasons for Israeli success

Intelligence USA supplied Israel with information - so they knew where the Arab forces were.

Arab forces not always co-ordinated. Units acted independently.



2

2.18

First Gulf War**Iraq & USSR**

- . Since World War II Iraq & USSR were friendly.
- Iraq & USA less friendly as USA for Israel & Iraq against

Iraq & Iran War 1980

- . USA supported Iraq in its fight against Iran after 1980 though officially it was 'neutral'

Iraq & Kuwait

- . Argue over borders
- . Iraq said Kuwait taking oil from Iraqi oilfields
- . Iraq agreed to supply Kuwait with water
- . Iraq needed money after war with Iran, but OPEC limited amount of oil it could sell.

Iraq & other Arab countries

- . Iraq relations were poor with other Arab countries
- . Saddam Hussain accused other Arab countries of siding with the USA
- . Iraq complained that Kuwait was producing more oil than it should
- . Iraq threatened Kuwait & UAE
- . Iraq demanded \$10 billion in compensation for taking oil, Kuwait offered \$9 billion
- . On 2 August 1990 Iraq bombed Kuwait City & the invasion began

2.19

First Gulf War land & air warfare**Iraq****Armed forces:**

- up to 1 million soldiers
- 5,500 tanks
- 700 aircraft



Saudi Arabia & UAE lent Iraq \$26 billion to fight Iran, & Saddam Hussain didn't think he should have to pay it back, as he had stopped the Iranians.

Iraqi invasion of Kuwait

- . air . land . sea .
- helicopters . commandos . boats .

invasion in 12 hours
fighting ended in 2 days

Iraqi invasion of Saudi Arabia?

USA & other countries feared SA would be next

Kuwait**Armed forces:**

- 16,000 soldiers
- 500 tanks
- 120 aircraft



If Iraq invaded Saudi Arabia then it would control most of the world's oil reserves

2.20

Iraq**Armed forces:**

- up to 1 million soldiers,
- 5,500 tanks, 700 aircraft

**Coalition forces**

34 countries inc. USA, UK, Arab countries

Armed forces:

950,000+ soldiers, 500 tanks, 2250 aircraft

**Coalition Air attack**

(17 Jan - 23 Feb 1991)
100,000 sorties
88,500 tons of bombs

**Coalition invasion of Kuwait**
retake Kuwait from Iraq
Operation Desert Saber**Coalition ground attack**

(24 - 28 Feb 1991)
. air supremacy
. special forces reconnaissance
. artillery bombardment
. tank attacks (using GPS)
. bulldozers in the desert

**Operation Desert Storm 1991****Coalition counter attack**

- . air force attacked Iraqi tanks at Khafji
- . Many Iraqi soldiers ran away as they could not stop air attacks

Coalition attacks Iraq

- . air force & anti aircraft guns
- . communication facilities
- . military targets (scud missiles)

Iraqi attacks Saudi

- . scud missile attacks on SA & Israel
- . invasion of Saudi at Khafji (29 Jan)



2

2.21

Guerilla Warfare**History**

. Guerrilla warfare became an increasingly used method of warfare during the C20th

. Proved to be effective for smaller, less well armed forces against larger more powerful armies.

. Used C6th in China + against the Roman Empire & Ottomans

Spain

'Guerilla' a Spanish word.
Spanish guerrillas (1810) attacked the French army, then 'disappeared into the mountains' - hidden by the local population.

"Guerrilla war is a kind of war waged by the few but dependent on the support of many."

China

Mao Zedong used guerrilla tactics very effectively against the Japanese & Nationalists in the 1930-40s.
Mao used 'hit-and-run' tactics & ambushes. The enemy were never sure when or where the next attack would come from.
Mao also made sure his army looked after the people, to get them on their side.

Guerilla tactics

These tactics became common when a small force has to fight a larger, better equipped force.

Very effective against an invading force when the guerrillas can hide amongst the local population.

Vietnam War**North Vietnamese**

NV Army & Vietcong (communists)



2.22

Not strictly a guerilla war, as NVA used conventional tactics as the war went on.

**South Vietnamese + USA**

ARVN Army & USA forces

- well armed, latest technology, powerful airforce

**Reasons why Vietcong won & USA lost**

| | | |
|---|-------------------|--|
| Guerilla 'Hit & Run' then disappeared into jungle or tunnels Retreated if out numbered Laid booby traps Ambushed patrols | Tactics | Bombing Bombing & 'search & destroy' turned Vietnamese against USA Didn't know who the enemy were Scared of going on patrols because of traps & ambushes |
| Highly motivated Defending their country Generally had peasant support - fed & hid them | Motivation | Low morale Many not know why they are fighting Just want to survive 365 days then go home Peasants against US - spied on them Average age 19 years |
| Experienced Been fighting for 30+ years, Japanese then French now USA | Experience | Inexperienced Little or no experience |
| Knew the terrain Their country - knew the terrain (jungles) | Terrain | Tough terrain Hot, humid jungles difficult for US soldiers |
| Well supplied Very well supplied through Laos & Cambodian trails - low technology (cycles) easily replaced Peasants feed them 250 km of tunnels - underground cities inc. stores, hospitals etc | Supplies | Well supplied But supplies dependent on helicopters |
| Spies - informants in ARVN | Other | Racial problems - disunity Drugs - many soldiers 'high' from drugs Less support from home - many people in USA against the war |

"You can kill ten of my men for every one I kill of yours, but even at those odds, you will lose and I will win."

-Ho Chi Minh
to the French, late 1940s

"The conventional army loses if it does not win. The guerrilla wins if he does not lose."

-Henry Kissinger
US government

Warfare

Changing methods of land warfare

2

2.23

Vietnam War



Tunnel 'towns'

Everything the Vietcong needed to survive for weeks at a time

Tunnel entrance

Well hidden. Suddenly an army could appear right behind you or an army could just disappear



Booby trap

Bamboo spikes. Such traps scared the US soldiers. 10% of soldiers died in booby traps.



Helicopters

US relied on helicopters to get troops in and out.



Booby trap

Grenades placed inside cans with pins removed - trip wire pulls out grenades which explode



Napalm

Destroyed the jungles in which the Vietcong hid, but killed everything inc. women and children





2

2.24

USA in the Middle East

USA had gradually extended its influence across the Middle East in the 1960s & 1970s e.g. Egypt, Saudi & Pakistan.

USSR's Brezhnev Doctrine

USSR had increased support to communists around the world.

USSR considered the USA to be in a weak position after its defeat in Vietnam.

Afghanistan

Islamic tribal population
Mountainous country
Poor infrastructure
Few large cities

Afghanistan Civil War

Amin led a communist government following a 'revolution' in 1978, that was anti Muslim.

The Mujahideen declared a jihad - a holy war - on the govt.

They fought a guerrilla war from the mountains.

The War

Dec. 1979 Soviet soldiers invaded killing Amin & putting Afghanistan under direct Soviet control. They claimed that they had been invited by the Afghan govt. after Soviet 'military advisors' had been killed.

The invasion was condemned by most of the UN General Assembly.

Within weeks the Red Army controlled the main roads & cities. BUT:

By 1982 the Mujahideen controlled 75% of the country. In 1989 Soviet forces withdrew from Afghanistan.

Afghanistan

Afghanistan Mujahideen

Lightly armed (some supplies from USA)
Supplied through Pakistan



USSR

Modern army

- well armed, latest technology, powerful airforce



2.25

Reasons why Mujahideen won & USSR lost

| | | |
|--|-------------------|---|
| Guerilla 'Hit & Run' then disappeared into the mountains & caves Retreated if outnumbered Laid booby traps Ambushed patrols Sabotage: damaged power lines & pipelines, radio & TV stations, hotels etc | Tactics | Bombing Bombing turned Afghans against USSR Didn't know who the enemy were Convoys on roads likely to be attacked in remote & mountainous areas |
| Highly motivated Defending their country Had Afghan support - fed & hid them Motivated Islamic fighters (jihad) | Motivation | Low morale Many not know why they are fighting Conscripts rather than professional army |
| Experienced Warlords experienced fighters | Experience | Inexperienced Little or no experience in fighting in Afghan conditions |
| Knew the terrain Their country - knew the terrain (mountains) | Terrain | Tough terrain Very cold & hot, not know the country Mountain roads easily attacked |
| Well supplied Very well supplied through Pakistan Used animals for transport | Supplies | Well supplied Supplies dependent on helicopters Mountain roads |
| Volunteers People from other Islamic countries joined the jihad in Afghanistan Finance Money to support the war came from other countries & individuals | Other | Equipment Poorly equipped for fighting in mountains & cold weather |



Mujhadeen

Waiting to ambush a passing convoy



Mujhadeen

Using an USA supplied stinger surface-to-air missile

Changing nature of
Warfare
Glossary

3

Glossary for Sea Warfare after 1939

Iraq



Convoys



Britain



USA

Enigma code German code, broken by British 'enigma' machine

Enigma machine

ASDIC or sonar, transmitted sound waves out - if they hit an object (submarine) underwater, echo signals were sent back = U boats could be found**U boats** German submarine**Wolf Pack** groups of U boats attacking ships**Convoys** ships travelling together protected by escorting warships**Air gap** area where British/US planes could not reach**Hunter killers** British warships that went after U boats, rather just protecting**Hedgehogs** anti submarine mortars fired from ships**Task force** group of warships (a mixed of aircraft carriers, destroyers, supply ships etc)

Two of the five U boats that made up the Eisbar Wolf Pack

Aircraft carriers ships from which planes could take-off and land**Dive bombers** aircraft with large bombs, attacking a target by diving from high

US dive bombers about to attack a Japanese aircraft carrier



USSR



Israel



Egypt



Kuwait



Afghanistan

Vietnam
(North)Vietnam
(South)



3

3.1 **U-boat events****1939****Start of WWII:**

Germans knew Britain needed supplies from the USA to fight the war. U-boat commander Donitz said...

"Stop the supplies = stop Britain"

1940**German invasion of France:**

gave Germany U-boat bases on Atlantic coast, easier to attack ships in the Atlantic Ocean.

**1940 - Feb 1941
'Happy Time 1':**

Germans cracked one British code which helped them find the convoys.

'Wolf Pack' tactics very successful

1942**'Happy Time 2':**

U-boats attacked US ships as they were not prepared. Not using convoys or using other tactics

1943**British supplies:**

Britain only had 3 months of supplies left



Sailors on a British ship looking out for U-boats

Key developments after 1939:

Submarines: U-boats to nuclear

Aircraft carrier: WWII to present day

U-boats

3.2

**U Boat commanders:**

commanders allowed to use own tactics in attacking ships

British underestimated

threat of U-boats.

Thought ASDIC (sonar) meant U-boats would be easily found & destroyed

**Reasons
for German
U-boat success
1939-43****Night attacks:**

U-boats attacking on the surface at night meant British could not use ASDIC to find them. Sound waves only worked when the U-boats were underwater

'Wolf Pack' tactics:

U-boats attack convoys at night.

Air gap:

aircraft could not cover all the distance over the Atlantic. In the 'gap' U-boats attacked the convoys.

British convoy escort boats:

out-of-date & not very effective against U-boats

3.3

Statistics vary on the number of ships

sunk by U-boat actions in WWII.

Important: see the trends:
of ships lost (compare to events)

| Estimates | From | To |
|-----------|-------|-------|
| 1939 | 50 | 120 |
| 1940 | 225 | 471 |
| 1941 | 228 | 480 |
| 1942 | 800 | 1,160 |
| 1943 | 203 | 377 |
| 1944 | 67 | 132 |
| 1945 | 30 | 56 |
| Total | 1,603 | 2796 |

"The Battle of the Atlantic was the dominating factor all through the war. Never for one moment could we forget that everything happening elsewhere, on land, at sea or in the air depended ultimately on its outcome."

— Winston Churchill

"The only thing that ever really frightened me was the Battle of the Atlantic."

— Winston Churchill

3

Key developments after 1939:

Submarines: U-boats to nuclear

Aircraft carrier: WWII to present day

3.4

U-boat events**1941****Enigma code:**

British captured U-boat 110 & got the keys to the code machine

1942**U-boats priority:**

Churchill said that stopping U-boats a priority

1942**Admiral Max Horton:**

changed tactics to 'hunter groups'.

1943**Black May:**

43 U-boats destroyed in May. They were now being destroyed quicker than they could be replaced.

Donitz said:

"We have lost the Battle of the Atlantic"

1944**U-boat attacks end:**

Donitz calls off the U-boat Battle of the Atlantic

1945**New improved U-boats**

launched but too late as Germany losing the war

3.5

**More escort ships:**

ships from Mediterranean sent to Atlantic to help

'Aircraft carriers':

early type of aircraft carriers (MAC) after 1943/44. Not sink any U-boats but when around less U-boat attacks

Reasons for British success**Enigma code:**

could follow U-boats movements and know where the 'wolfpacks' were forming

Merchant ships:

Britain & USA replacing their ships quicker than being destroyed.

'Hedgehog' mortars:

fired from ships - covered a large area

'Hunter killer groups':

escort ships could leave the convoy to follow U-boats, until they had to surface for air then attack them

Long range aircraft:

US Liberator planes fly further & closed the 'gap'. Used island of Azores as an airport.

3.6

Consequences: The Germans failed to stop the flow of supplies to Britain.

This allowed the Allies to get the necessary supplies to Britain for the D-Day landings in June 1944.

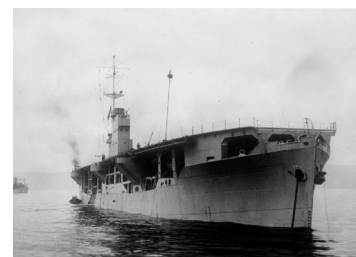
Losses were huge:

Allies: 3,500+ ships sunk (not all by U-boats) + 175 warships
72,000 sailors killed

Germans: 783 U-boats
30,000 sailors killed, (out of 40,000)



Hedgehogs: anti-submarine mortars



Aircraft carriers used in WWII

3

Key developments after 1939:

Submarines: U-boats to nuclear

Aircraft carrier: WWII to present day

3.7

Nuclear submarines**History**

. After the success of the U-boats in WWII, submarines were to become very important in the Cold War

. USA: USS Nautilus 1952



. USSR: Leninskiy 1958

. UK: HMS Resolution 1968

Cold War: 400+ nuclear subs

Now: about 120+

Nuclear weapons

Submarines armed with missiles with nuclear warheads plus other types of missiles

Missile range = 4,000+ miles

Typically 24 missiles with multiple war heads that split to hit different targets

Six countries

have nuclear subs:

USA, Russia, France, Britain, India & China

3.8

**Nuclear submarines**

Quieter when moving
. less easily detected

Less refuelling
. only stop for food supplies
(distills own water)

Faster
. up to 60km/h

Extra power
. carry more equipment
inc. weapons

Advantages

Long range
. ideal for ocean to ocean travel

Stay underwater for longer
. as long as crew can stand to be underwater!

3.9

Nuclear subs
. gives off heat 'thermal footprint'
. steam noise

Very expensive
. cost for US sub = \$2 billion
. diesel sub = \$500 million

Not totally 'silent'
. diesel subs can turn off their engines and be totally silent

Disadvantages

Accidents
. serious accidents involving nuclear subs - 9 sinkings

USA 'Scorpion' 1968
. sank killing 99
. torpedoes exploded

Russia: 'Kursk' 2000
. sank killing 118
. torpedoes exploded

Specialist knowledge
. specialist knowledge & equipment needed
. expensive maintenance



3

3.10

Aircraft Carriers**History**

- . Ships used to launch hot air balloons in C19th
- . During WWI ships converted for seaplanes - with some success

**HMS Ark Royal**

. perhaps the first aircraft carrier in 1914

- . 1917 first plane (Sopwith Camel) to land on a ship
- . 1918 first successful attack by planes from HMS Furious on a Zeppelin base

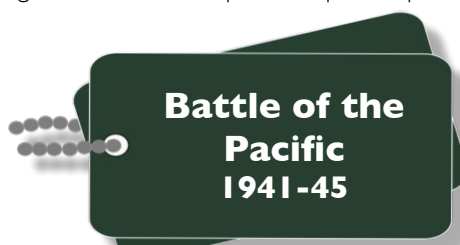
First purpose built
Aircraft Carriers:**Japan's Hosho 1922****HMS Hermes 1924**

3.11

Pearl Harbor (Hawaii)**7 Dec 1941**

- . Japanese surprise attack on US Pacific Fleet at Pearl Harbour
- . 360 fighter & bomber planes from carriers 400km away
- . 20 US ships sunk + 300 planes
- . 4 US carriers not at Pearl Harbour so escaped damage

Control of huge Pacific Ocean depended upon air power = aircraft carriers

**Battle of the Pacific 1941-45****US Intelligence**

- . US was able to intercept & listen to Japanese coded messages to locate their ships & carriers

Battle of Midway June 1942

- . major sea battle of WWII
- . US dive bombers sunk 3 Japanese aircraft carriers & badly damaged a fourth
- . US lost one carrier
- . US now had control of the skies in the Pacific

Battle of the Coral Sea May 1942

- . US attacked Japanese fleet with planes from their carriers
- . Planes attacked planes & carriers
- . US lost one carrier & Japan lost two

3.12

Importance of submarines & aircraft carriers:

Argentina invaded Falkland Islands, UK sent a task force to take them back

UK Task Force

- . 2 x aircraft carriers
- . destroyers + supply ships
- . bombers flew from Ascension Island

Sea warfare

- . British submarine sank an Argentinian cruiser
- . Argentinian navy then stayed in port

**The Falklands War South Atlantic 1982****Britain takes back Islands**

- . Britain = lost 6 ships + 25 dead
- . Argentina = lost 1 sub, 1 ship, 75 aircraft, 649 dead + 11,000 taken prisoner

**Air warfare**

- . Argentinian aircraft attacked British ships with Exocet missiles
- . British planes from carriers protected soldiers when they invaded

Changing nature of
Warfare
Glossary

4

Glossary for Air Warfare after 1939

London Blitz



Children being evacuated from London



Rolling Thunder



Britain



USA



Hurricane & Spitfire



Messerschmidt 109



V2 rocket

Blitz fast, violent attack - London Blitz the bombing of the city by the Germans**Evacuations** people moved from an area in danger (children out of British cities during the bombing by the Germans)**Reinforcements** extra troops join the battle, after the first attack**Civilians** ordinary people, not fighting people (not army)**Chemical weapon** a munition (bomb) which causes injury/death through chemicals**Luftwaffe** German airforce**RAF** British airforce**Air superiority** name for having control of the air over the enemy**Hurricanes & Spitfires** British fighter planes**Messerschimds** German fighter planes**Incendiary bombs** bombs made to cause fires**Homeless** having no home - homes destroyed by bombing**V rockets** first long range missiles**Rolling Thunder** name given to bombing of North Vietnam by US**Stealth aircraft** planes that avoid being seen by radars

Iraq



USSR



Israel



Egypt



Kuwait



Afghanistan

Vietnam
(North)Vietnam
(South)



4

4.1

Air Warfare**13 August
Eagle Day**

. start of the attacks
 . attacked radar stations
 in SE England - 1485 sorties

Losses:

Germany 45
 RAF 13

**15 August
Airfield attacks**

Intense attacks on airfields to
 destroy RAF - 1790 sorties

Losses:

Germany 75
 RAF 34

**17 August
Operational Area**

Germany declared an
 operational area around Britain
 & said it would attack any ship
 in that area

**25 August
Berlin bombed**

RAF bombers attacked Berlin

**7 September
London bombed**

300 German planes bomb
 London

**15 September
German losses**

After daylight bombing raid
 German lost 56 planes

**17 September
Invasion postponed**

Operation Sea Lion
 postponed as losses too great
 & Hitler looking to invade
 USSR in the east

4.2

Battle of Britain 1940**Radar**

Radar gave British early warning of
 German attacks - 50+ stations across
 southern England

'Downing System'

complex system of communications
 to analyse enemy attacks &
 co-ordinate RAF response

German mistakes

1. Stopped bombing
 RAF bases & bombed
 London giving the RAF
 time to recover
2. Under-estimated the
 strength & capabilities
 of the RAF

**Reasons
for
British
success****'Home advantage'**

1. British morale was high as defending
 their home country from invasion
2. British pilots who parachuted out
 landed in their home country, whilst
 Germans were captured & taken prisoner

British aircraft & pilots

1. RAF Spitfire & Hurricane
 were a match for Luftwaffe's
 Messerschmidt. Germans lost
 twice as many aircraft
2. German pilots were over-
 worked after fighting in
 Europe & flew longer missions
 than British pilots
3. British pilots were better
 trained for 'dogfights' than the
 Germans who had spent more
 time attacking ground targets.
4. German planes had only 30
 minutes over Britain before
 they had to return

"Never, in the field of human conflict was
 so much owed by so many to so
 few.....their finest hour" - Winston Churchill
 British Prime Minister



British fighter aircraft going to
 intercept German bombers

Part of the
 British radar system



4

4.3 **Bombing after 1941****Second Blitz 1944-5****German V Rockets****VI Rockets**

'Flying bomb' fell to the ground after it ran out of fuel.

Over 6,000 were fired causing 20,000 deaths in SE England.

Fighter planes could intercept them.

V2 Rockets

Too fast at (4,000km/h) for fighter planes. No warning. Only 500 V2s hit London as war came to an end.

Allied bombing of Germany:

- . to slow industrial war production
- . destroy German morale
- . bomb German into submission

Cologne May 1942

1,000 bombers
killed 40,000 people

Hamburg July 1943

3,000 bombers killed 43,000
city burned,
ind. production dropped

Dresden February 1945

controversial as little industry
in the city & 100,000 + killed

Criticisms:

- . Wrong to target civilians & used incendiary bombs to cause fires
- . Industrial production slowed only a little (10%)
- . German morale affected, but German propaganda made Allies into 'devils'
- . Air power not enough to win the war
- . Allies lost 142,00 airmen

4.4

Blitz
1940 - 1941
examples**Plymouth 1941 - 1944**

.Target: **docks - ship building/repairs**
bombed 59 times
Killed: 1,172 Homeless: 30,000+

Liverpool 1 - 7 May 1941

.Target: **docks**
most heavily bombed area outside of London
3rd May 1941 - 500+ bombers
Killed: 2500+ Homeless: 200,000+

Clydebank (Glasgow) 13-14 March 1941

.Target: **docks - ship building/repairs**
Only 7 out of 12,000 houses left
500+ bombers
Killed: 500+ Homeless: 40,000+

Evacuations
Most major cities
evacuated their
children to the
countryside, during the
Blitz

4.5

Hitler called off the bombing campaign in 1941.
Bombing continued but not on the same scale.
The Luftwaffe were moved to the Eastern Front to help the invasion of the USSR

Consequences**Morale**

Generally people were more determined to fight the Germans & help the 'war effort'

Industrial production continued

Despite damage, repairs were made quickly and war production continued

V rockets too late

Rockets came too late in the war

Morale

Some areas did suffer a loss of morale
e.g. east end of London

Deaths & injuries

Over 50,000 people killed, plus injured & homeless

Destruction

Most major cities suffered serious damage

V rockets

Caused major damage to homes & people were scared of them - the randomness





4

Air Warfare**First Gulf War
1990 - 1991**

Coalition forces air attack of
over 100,000 sorties.

Destroyed Iraqi
air force
& anti-aircraft sites,
communications etc.
Included aircraft from
6 aircraft carriers.

Stealth Aircraft**Lockheed F117
BlackHawk**

Shape less detectable by radar,
as it deflects radar waves to the
sides & not back to the radar
stations.

B2 bomber

More advanced than the F117.
Had curved body and wings.
Almost invisible to radar as it
can absorb radar waves.
Has low thermal (heat) visibility
But can be seen from about 20
miles away
Can fly for over 40 hours.

4.6

Air warfare 1945 - 2003

After 1945 air warfare dominated by Cold War



- Both USA & USSR spend huge amounts of money developing:
 - . jet aircraft, fly faster & higher
 - . missiles - inter-continental ballistic missile & air-to-air missiles
 - . low flying aircraft to avoid radar & stealth aircraft

4.7

Importance of air power

- . surprise attacks on airfields

4.8

Limitation of air power

- . determined enemy & guerilla tactics



Heavy bombing of North Vietnam



Famous picture showing Vietnamese children
running away from a napalm attack



Helicopters as part of 'search & destroy'

Six Day War

Victory for Israel because of air superiority.

- Surprise attack on Egyptian Air Force, wiped
out most of their 420 aircraft.
- Then attack the air fields of:
Jordan, Syrian & Iraq.
- Within two days Israel had control of the air.
- Tanks attacks with air support = victory

Vietnam War**Rolling Thunder:**

- . US bombing of military & industrial targets
 - . last nearly 4 years
 - . largest bombing campaign
- BUT:
 - . whilst caused huge damage, Vietnam had little
industry to bomb
 - . made Vietnamese more anti-American
 - . cost \$400,00 per soldier killed

Chemical weapons:

- . USA clearing the jungle with chemical bombing
so nowhere for enemy to hide
- BUT:
 - . made little difference to finding enemy
 - . killed many innocent civilians
 - . made Vietnamese more anti American
 - . world turned against USA

Search & destroy:

- . USA used helicopters to land in a village &
destroy it hoping to catch the enemy hiding there
- BUT:
 - . killed innocent villagers
 - . destroyed villages
 - . made Vietnamese more anti-American

Changing nature of
Warfare

Development of atomic & nuclear weapons



5

5.1

Atomic bombs

1945

Development of the atomic bomb

Secret development of atomic bomb was called: **'Manhattan Project'**.

Joint project between USA, UK & Canada.

Preparations

509th Composite Group
Formed in 1944 to train to drop the atomic bomb on Germany & Japan if needed.
Possible targets were identified.

Potsdam Conference

Allied leaders explained the terms of surrender for Japan, but they refused to surrender.
Allies said without a surrender they would "cause utter destruction upon Japan."
Truman (USA) did not mention the atomic bomb.

Atomic bomb testing

The testing of an atomic bomb in New Mexico was successful.
The 'Little Boy' bomb was ready by 15 June and shipped to the airfield on the island of Tinian.
By 26th July all was ready.

Development of nuclear weapons

Greatest change in warfare in C20th



Never been used in warfare since 1945

5.2

Some say the estimates of how many lives the USA would have lost in an invasion were greatly over exaggerated. Japan was weak and with the USSR now against them they would have surrendered within 2 weeks.

Military

Truman said decision to drop the bomb was purely military. Japan had been offered a chance to surrender but refused.
Fighting the Japanese on Pacific Islands had been very difficult - a full invasion of Japan may have cost the USA the loss of up to a million lives. The Japanese had already used 3,500 kamikaze attacks on the US.

Political

By dropping the bombs on Japan, the USA was giving a strong message to the USSR - a warning.
The USA was saying it is the number one military superpower. Perhaps it was the start of the Cold War.

Reasons for using atomic bombs on Japan in 1945**Economic**

USA wanted to make sure that it controlled Japan after the war and not let the USSR have any influence over Japan.

The development of the atomic bomb (Manhattan Project) had cost the USA a lot of money and they wanted to show it was worth it.



Hiroshima after the bombing

5.3

Consequences**Short term**

Deaths: Hiroshima 120,000+
Nagasaki 60,000+

Japan surrendered

Stalin angry that USA developed the atomic bomb in secret (though USSR knew through spies)

Medium term

Deaths continued
Psychological traumas

Started a nuclear arms race as USSR developed their own atomic weapons after 1949

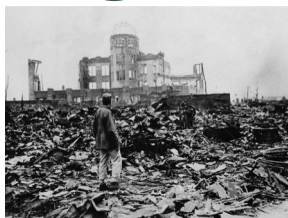
Long term

Deaths: high rates of birth defects & cancer rates

Both USA & USSR not use nuclear weapons having seen the effects of them

Changing nature of
Warfare
Glossary

5



Effects of atomic bomb at Hiroshima



Atomic bomb at Nagasaki



Sputnik



Polaris submarine

Glossary for nuclear & high tech weapons

Atomic bomb or fission bomb works by splitting the nuclear atom to cause an explosive chain reaction

Hydrogen bomb or thermonuclear bomb works like a fission bomb but using more plutonium to create a more powerful explosion

Nuclear bomb name for all bombs using a nuclear reaction - atomic or hydrogen - which use a small amount of matter to release huge amounts of energy

Manhattan Project name given to the project to develop the first atomic bomb

ICBM Inter-continental Ballistic Missile - missile that is fired from one continent and can reach another - uses rockets plus gravity to fall onto its target

IRBM Intermediate Range Ballistic Missile - less range than ICBM but more accurate

Sputnik name of first (USSR) satellite in space (transmitted a radio signal back to earth)

Cuban Missile Crisis event when USSR placed nuclear missiles on island of Cuba, USA objected - stand-off between the two until USSR agreed to remove missiles (risk of nuclear war between US & USSR)

Polaris Submarines type of submarine that can fire nuclear missiles

Non proliferation stop the spread of nuclear weapons

Kidnapping taking someone against their will

Hostage taking someone & demanding something for their return

Hijacking - Skyjacking taking of a vehicle or plane

Assassination killing of someone

War on Terror USA's war against terrorism after 9/11

Drone remote controlled aircraft

GPS Global Positioning Satellite - using several satellites to fix a position

Conventional weapons non 'high tech' weapons e.g. tanks, soldiers, artillery etc

Laser guided weapons weapons that use a laser, to guide them to their target

5

**Background
Rocket technology**

5.4

World War II

Germany had developed V1 & V2 (ballistic) rockets, to which there was little or no defence at the time.

At the end of the war both the USA & USSR wanted the German technology & engineers.

After World War II

USA's rocket team was led by the German, Von Braun who was taken from Germany.

In addition the USA built up a huge bomber capability: Strategic Air Command with bases in Europe.



Wernher von Braun

USSR's team was led by the Soviet, Korolev. Stalin wanted Intercontinental Ballistic Missiles developed to counter the USA's air force.



Sergey Korolev

Nuclear Arms Race 1945 - 1960

The USSR quickly followed the USA with an atomic bomb of their own.

The nuclear arms race had begun.

Never been used in warfare since 1945

5.5

**USA****Hydrogen bomb**

Tested successfully.

2,500 more powerful than atomic bomb & lighter, so better for missile use.

UK has atomic bomb.

B52 bomber

Long distance bomber (6,000 miles) & able to drop nuclear bombs

Missiles

Shocked by USSR's Sputnik success USA launches 'Explorer' & then puts Intermediate Range Ballistic Missiles (IRBM) in NATO countries close to the USSR.

Submarines

USA launches first nuclear powered submarine capable of firing a Polaris missile from underwater with an atomic warhead.

5.6

**USSR****Atomic bomb**

Tested first atomic bomb



testing of USSR's H bomb

Hydrogen bomb

Tested first hydrogen bomb.

Missiles

Following launch of space satellite 'Sputnik', they tested first Intercontinental Ballistic Missile (ICBM) capable of carrying a H Bomb from the USSR to USA.



USSR's ICBM

photo: Tekhnika Molodezhi

1949 1952 1953 1957 1958 1960

5

5.7

Mutually Assured Destruction (MAD)

By 1960s both sides had large numbers of nuclear weapons, which could totally destroy each other.

The theory was that neither side would attack each other as both sides would destroy each other: MAD. Nobody could win a nuclear attack or war.

**USA - Strategic Defence Initiative (Star Wars) 1983**

- . the idea was for an umbrella - that could stop USSR missiles ever reaching the USA
- . satellites in space, armed with lasers, would destroy the missiles in space
- . Reagan thought that SDI would make the USSR reduce their arms
- . in theory the USA could now 'win' a nuclear war
- . USSR did not have the money to compete with the USA

Nuclear Arms Race 1960 - 1991

The USSR built more weapons to 'catch-up', whilst the USA built better quality weapons, particularly missiles.

5.8

**USA**

5.9

**USSR****Submarines**

Polaris submarines carried 16 missiles x 4 warheads = 64 nuclear warheads - fired at different targets
Launched from any sea location

USA 'Safeguard' a defence plan for missile bases

USA

ICBMs = 8,000
Planes = 4,000
Tons = 4,100

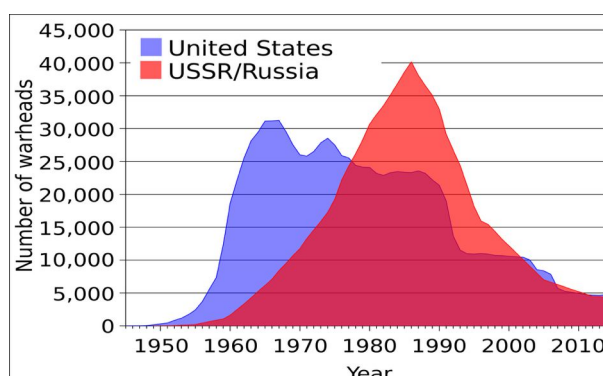
USSR helped China

with development of nuclear weapons, but they fell out in late 1950s, so China worked on its own in 1960s

China tests uranium bomb
First of 45 tests Chinese carried out
China tests Hydrogen bomb in 1967

**USSR**

ICBMs = 7,000
Planes = 5,000
Tons = 8,000



Submarine missile launch



Source: en.wikipedia.org

Changing nature of
Warfare

Development of atomic & nuclear weapons



5

5.10

Background

1950s: people very aware of threat of nuclear war

Anti war: **Campaign for Nuclear Disarmament (CND)**

led protests in the UK & other demonstrations across Europe

Cuban Missile Crisis 1962

brought the USA & USSR close to nuclear war
US Kennedy & USSR Khrushchev keen to improve relations after U2 crisis & CMC

Test Ban Treaty 1963

- . only underground nuclear tests for USSR, USA & UK
- . China & France not sign
- . no agreement on disarmament

Non-Proliferation Treaty 1968

- . 100+ countries agree not to develop nuclear weapons
- . those with nuclear weapons agree to end arms race & negotiate about disarmament
- . promote peaceful use of nuclear technology but not use for developing nuclear weapons

"not to transfer nuclear weapons or devices" and "not in any way to assist, encourage, or induce"

Attempts at arm limitation

Late 1960s & 1970s period of detente (USA & USSR more friendly)

Both sides wanted to reduce spending on arms race & reduce tensions

5.11

Strategic Arms Limitations Talks

- . Limited certain types of missiles e.g. ICBM & submarines
- . Have only 2 anti-ballistic missile bases (ABMs)

**SALT I
1972**

- . Individual missiles could have multi-warheads
- . Allowed to replace existing missiles (with more modern missile bases)

- . Limited certain types of missiles to 2,250
- . Banned new missile programmes

**SALT II
1979**

- . USA pulled out of agreement after USSR invaded Afghanistan
- . USSR never implemented the agreements

5.12

Strategic Arms Reduction Talks

- . President Reagan proposed limit of 5,000 warheads

**START
1982-3**

- . USSR withdrew from talks as they objected to Reagan's SDI plans

5.13

Intermediate Nuclear Forces

- . Abolish nuclear missiles launched from the ground with a range of 500-5500 kms
- . Each side to inspect each other

**INF
1987**

- . Signed by Reagan (USA) & Gorbachev (USSR)
- . By 1991 nearly 3,000 missiles destroyed



6

Terrorism

Types of terrorist activity:

Kidnapping & hostage taking

- . to bargain with govts.
- . to get money
- . to get publicity for their cause & organisation

Armed attacks & assassinations

- . limited armed attacks
- . ambush (guerilla tactics)
- . kill selected victim
- usually high profile -
- close up or with bomb



Black September carrying out an attack at the 1972 Olympic Games in Munich

Hijackings & skyjackings

- . taking of vehicle or aircraft
- . holding passengers hostage (see above)



One of the aircraft at Dawson's Field

6.2

Terrorism

Terrorism has dominated end of C20th and the beginning of the C21st especially after 9/11 attacks

Terrorism designed to create fear through a range of actions, often targeting civilians - easy targets, who are difficult to protect.

Create a powerful image that is greater than they really are - scare people.

6.3

Terrorist organisations

Modern terrorism: after WWII terrorist organisations formed to seek independence from colonial powers.

Viet Minh v France in Vietnam Muslim Brotherhood v Britain in Egypt

National Liberation Front v France in Algeria

1960s rise in communist revolutionary terror groups: ETA in Spain; PLO in Palestine:

Japanese Red Army; German Red Army Faction; different groups in South America and Africa - often supported by USA or USSR during the Cold War:

In South Africa the ANC used terror to oppose the apartheid white govt.

The Popular Front for the Liberation of Palestine (PFLP)

- . set-up to highlight the situation in Palestine in 1968
- . skyjacking easier than attacking Israel
- . Dawson's Field - skyjacked four planes & flew them to Jordan where they blew them up in front of the world's TV cameras

Irish Republic Army (IRA)

- . against the British being in Northern Ireland
- . tactics inc. kidnappings, assassinations, bombings in NI & Britain inc. London, Birmingham & Manchester

Hamas (Islamic Resistance Movement)

- . against the state of Israel
- . Suicide bombers
- . Missile attacks

Hezbollah (Party of God)

- . Established in 1982 to fight against state of Israel
- . Kidnaps Israeli soldiers
- . Suicide bombers against Israel
- . Missile attacks on Israel

Al-Qaeda

- . wanted an Islamic state in Arabia - not have non-muslims there
- . against USA military in Arabia

Black September

- . Palestinian terrorists seeking revenge on King of Jordan who expelled Palestinians from Jordan
- . took hostages then killed 11 Israelis at Munich Olympics in 1972

Warfare

Warfare at the beginning of C21st



6

6.4

Terrorist attack

9/11

Most infamous of all terrorist attacks

- . 11 Sept 2001
- . Al-Qaeda terrorists hijacked four airliners
- . Two were crashed in the World Trade Centre in NYC
- . One was crashed into the Pentagon building in Washington DC
- . One crashed in into a field after passengers attacked the terrorists



Consequences

War on Terror

- . USA invaded Afghanistan to overthrow the Taliban who were helping Al-Qaeda

Second Gulf War

- . USA + others invaded Iraq to overthrow Saddam Hussein who was allegedly supporting terrorism & Al-Qaeda

6.5

Second Gulf War 2003



Weapons of mass destruction

- . USA-UK believed Saddam Hussein was developing weapons of mass destruction that could reach Europe inc. nuclear & chemical

War had no
United Nations
mandate

No weapons of
mass destruction
were ever found

Supporter of terrorism

- . supported terrorist groups around the world including al-Qaeda

USA-UK Reasons for invading Iraq

Free the Iraqi people

- . free the Iraqis from the dictator Saddam Hussein

19 March

Missile attacks
Stealth bombers & cruise missiles fired from ships & submarines targeting leaders around Baghdad

20 March

Land & air attacks
Co-ordinated land & air attacks in southern Iraq: Umm Qasr & Basra
Bombing of Baghdad

23 March

Winning key battles in Basra, Nasiriyah & Umm Qasr, though Iraqi forces fighting back. In northern Iraq US forces joined up with Kurdish fighters - firing 50 cruise missiles

7 April

Land & air attacks on Baghdad as UK soldiers reached the centre of the city, giving them victory

5 April

Land & air attacks on Baghdad as US soldiers entered the capital in numerous attacks

30 March

Air attacks on Baghdad continued, Iraqis soldiers defended the city. Iraq fired missiles at Kuwait but damage was limited

6.6

Iraqi forces

- . low morale
- . air force destroyed on the ground
- . tanks & artillery outdated
- . poor military leadership from Saddam Hussein

Reasons for USA-UK success

USA / UK forces

- . professional forces
- . more advanced weapons
- . air superiority
- . attacked strategic points not fight large armies

6.7

Consequences

Iraq

- . up to 7,000 civilians died
- . Saddam Hussein was overthrown & caught
- . civil war broke out

Coalition forces

- . won with combination of air & land forces + high tech weapons

Terrorism

- . did nothing to stop terrorism, if anything increased it as many saw the war as unjustified & illegal

Warfare

Warfare at the beginning of C21st



6

6.7

High tech weapons

Computerised Satellite technology

. Drones

- . used for reconnaissance & missiles
- . guided from far away by joysticks viewing via cameras

. Joint Direct Attack Munition

- . a unit which is attached to bombs then guided by GPS

. Joint Standoff Weapon

- . uses GPS to find its target in all weathers

. High Powered Microwave

- . releases high powered electrical energy to destroy electrical equipment within 600 metres

. Thermobaric weapons

- . bomb that uses up the oxygen in the atmosphere
- . good if confined spaces e.g. caves & bunkers

Conventional weapons

In Iraq & Afghanistan US led forces have needed conventional forces: soldiers, tanks, armed vehicles, aircraft. Close range fighting makes technology less effective.

6.8

High-tech warfare

Stealth bombers

- . largely invisible to Iraqi radar
- . first attacks from the Stealth bombers - Iraqis had no idea what was happening

Cruise missiles

- . fired from a long way away
- . fired from warships & subs

Precision Guided Munitions (Smart Bombs)

- . laser guided to hit their targets
- . smoke or dust could send them off target
- . less than 10% of bombs dropped were 'smart'

First Gulf War 1990

Helicopters

- . Apache attack helicopter had laser guided weapons

Abrams tanks

- . laser guided weapons
- . laser guided rangefinder
- . fired depleted uranium rounds that went straight through the Iraqi tanks

Patriot missiles

- . defence missiles to shoot down incoming missiles

Even with all the high tech weapons, B52s carpet bombed Iraqi soldiers & the USA-UK sent in 500,000 troops to push the Iraqis back.

6.9

Precision Guided Munitions (Smart Bombs)

- . GPS guided bombs
- . not bothered by cloud, dust or smoke

Invasion of Iraq 2003

Vehicle tracking system

- . known as Blue Force Tracker able to track friendly vehicles via GPS to avoid attacking own side
- BUT problems with satellite links & getting information to everyone
- . downloading information could take hours

Sensors

- . motion, heat & image sensors via satellite to detect Iraqi forces
- BUT
- . soldiers on the ground did not know about the Iraqi forces they were facing

Sensor Fused Weapons (Skeet)

- . anti-tank aircraft fire skeet which then breaks up into smaller units and targets, through heat sensors, individual tanks