Lesson 17: Waves of War
Evaluation of 'Wave War'

The end results depends upon the choices made by <u>both</u> groups and the ways in which each decision affects another. Each team made three choices, each of which gives them some 'victory points' (in brackets after the choice or explanation). The explanation for their choice will give more points up to the maximum stated. Extra points are awarded for their ideas about the 'death ray' problem. The difference in the number of points scored by the two teams decides the outcome of the war.

Red Team scores

1. **Radar controlled gunnery** (3) Allows night fighting (2) Will increase enemy casualties (1) and improve own morale (1). **Max 5vp**
2. **Night-Fighter Radar** (1). Only effective if enemy is bombing at night, since Blues are currently winning, they probably could stick to day flying. **Max 1 vp**
3. **Anti-radar systems** (1) If possible system suggested (blip enhancing or "chaff dropping" work well) then would reduce effectiveness of Blue radar(2) However, if the system is used Blue may well copy it, destroying red advantage. **Max 3vp** if Blues don't pursue radar, **Max 1 vp** if they do.
4. **Anti-ship radar** (2) Since ships will be needed to land on a island, this technology would allow night attacks against enemy troop and supply ships (2). It should be quite easy to build since ships are big (1) **Max 4 vp**.
5. **Anti-Sub radar** (1) This is harder to do since it needs lower wavelength radar signals. It is easier to develop if anti-ship radar is also being developed (1) but submarines can only attack shipping, so it only becomes important when Red ships might liberate their old territory. **Max 2 vp** if developed with anti-ship radar.
6. **Longer range radar**. Longer range means more warning of attack, but how much warning is needed? A piston engine plane of the time of the development of radar would take at least half an hour to travel that distance. Nice but not vital **Max 1vp.**
7. **More detailed shorter range radar**. The team need to suggest lower wavelengths for this to work. This development might be useful when combined with other ideas, but isn't vital in itself. 1vp unless 1,5 or 8 also selected then **Max 3vp.**
8. **Vehicle radar**. Might allow night fighting, but no way to detect what is a vehicle and what is a rock or a tree. Not very useful. **0vp.**

Death ray problem.

1. Range would be very short due to cone-shape of beam spreading energy out quickly. **1vp**
2. Suggesting focusing to prevent this **1vp.**
3. Difficult to control the path of Gamma and x-rays. **2vp**
4. Power consumption huge. **1vp**
5. Cloud or other natural obstacles would stop many waves. **1vp**
6. Metal planes would reflect/absorb most waves. **2vp.**
7. Probably not a good idea **3vp.**

Max score possible: 23 victory points.

Lesson 17: Waves of War
Blue Team scores

1. **Bombing radar stations**. Basically a good idea. Suggesting high level raids scores **1vp**, since the targets are small and quite well protected. Suggesting a low-level raid together with a plan of how to reduce enemy response (anti-radar device see point 3 or attacking airfields first?) scores **3vp**. Simply opting for low level attack scores **2vp**. **Max 3 vp**

2. **Anti-radar techniques. (A).** Battleships need to face the radar position, not to allow it to spot them from the side, since ships have a much larger area from the side than the front or back. **1vp** + **1vp** for noting that ships can't be spotted by current radar.
(B) Submarines. At this stage it is not worth staying underwater- the slow speeds and lack of clean air probably put the sub in more danger than air attack using radar. **1vp** +**1vp** for suggesting that tactics might have to change eventually. **Max 4 vp**

3. **Confusing radar**. Suggesting sudden course changes or indirect path on target 1vp. Dropping reflective devices (chaff) scores 2vp. Sending lone planes with radar emitting beacons to drown out genuine signals scores 3vp. **Max 3 vp**

4. **Death Ray Problem**

   - Range would be very short due to cone-shape of beam spreading energy out quickly. **1vp**
   - Suggesting focusing to prevent this **1vp**.
   - Difficult to control the path of Gamma and x-rays. **2vp**
   - Power consumption huge. **1vp**
   - Cloud or other natural obstacles would stop many waves. **1vp**
   - Metal planes would reflect/absorb most waves. **2vp.**
   - Probably not a good idea **3vp**.

5. **Suggesting all-out attack before new enemy developments** score **2vp**. It is very hard to catch up a technological gap. The Reds will also improve their system even as the blues do. If Blues do suggest pursuing Radar fully then they need a plan of how to reduce Reds research (spying, bombing etc) to score **1vp**. **Max 2vp**

Max Score possible: 23 victory points.

Lesson 17: Waves of War
How to find the winner
Take Red score minus Blue score

Difference	Result
7+	Blue losses become critical. After a year of hard fighting, Reds counterattack. Blue's collapse and surrender in 18 months time.
3 to 6	Blues take heavy losses. Plan to invade Red island cancelled. War goes on for four more years before Blues surrender. Heavy casualties on both sides, Yellows delighted!
1 to 2	Blue losses heavier than expected. Invasion of Red island postponed. Peace deal leaves Blues in control of most of their conquered territory.
-1 to 2	Blue forces land on Red island but struggle to stay supplied. After 1 year of hard fighting war ends. Reds keep their island but loose all the rest of their territory.
-5 to –2	Blue forces land on red island and eventually overcome resistance. New Red Government secretly controlled by Blues
less than -5	Total Blue victory. Red forces smashed in 6 months. Reds become province of Blue country.

Historical note.

This exercise is based on the technological race during WW2. British Radar and poor German tactics probably prevented a German victory in 1941. Later the destruction of German U-boats by Allied Radar equipped bombers allowed D-day to go ahead. The American use of Radar for battleship gunnery was a major advantage against the Japanese fleet. This was less of an issue for the British against the Germans because the German fleet was much smaller anyway.