

## **TEACHERS GUIDE – PUFFING BILLY**

### **CURRICULUM APPLICABILITY**

#### **HSIE**

The Puffing Billy module is principally applicable to the upper primary school curriculum for Human Society and its Environment (HSIE) studies.

The key curriculum concepts covered by the module include:

##### Change and Continuity

- Significant events and people
- Time and change

##### Cultures

- National identity
- Cultural diversity

##### Environment

- Relationships with environments
- Patterns of settlement and land use
- Natural resources

#### **Science and Technology**

There is also scope to use the Puffing Billy module in the primary science and technology curriculum, mainly in discussing the following topic areas:

- The way in which people shape the built and natural environment
- Transport systems
- Forms of energy
- Mechanical systems

## **CONTEXT / BACKGROUND INFORMATION**

The Puffing Billy Railway now operates as a tourist attraction in the Dandenong Ranges between the country towns of Belgrave and Gembrook. The line was one of four experimental tracks (2'6" narrow gauge) built at the turn of the century in an attempt to open up the rural areas of Victoria. Originally, the trains ran between Upper Ferntree Gully (then known as Ferntree Gully) and Gembrook, carrying passengers and freight (mainly timber).

The regular services on the railway were abandoned in 1953, after it had been blocked by a landslide and the railway was officially closed in 1954. By that stage, better roads and increased private vehicle ownership had made the line redundant, or at least unprofitable. But a dedicated band of volunteers and advocates kept the memory of the region's steam trains alive. In 1959, with the help of the Citizens' Military Forces (forerunner of the Army Reserve), the landslide was bypassed and in 1962 a section of the old route was reopened. This was gradually extended and rebuilt until the present track was opened in 1998.

The Puffing Billy Preservation Society depends heavily on enthusiastic volunteers to operate. It is one of only a handful of steam trains around the world that still operate on a daily basis.

## GENERAL “CHALLENGE” NOTES

Students progress through a journey by solving challenges at different 'stops' along the way. Most of these challenges are based around the viewing of archival footage of the towns, people, geography and history of the rail line. Some of the videos are directly related to train travel and rail history, whilst others are more concerned with the society and culture of the places en route. Each clip or exercise will generate discussion points that can be pursued in class.

There are four types of challenges that the students might encounter along the way:

**Multiple choice:** pick the correct answer from four alternatives.

**Drop and Drag:** pair up answers and questions from a scrambled list.

**Jigsaw Puzzle:** arrange a broken image into its complete form.

**Game:** play a simple animated game and reach a minimum score.

After completing each challenge, students will pass on to the next stop. At the end of the module, a final picture puzzle will provide students with a certificate that can be printed off as 'proof' of completing the journey.

## LOCATION CHALLENGES

### 1) IN THE SHED

This video should demonstrate to students the complicated procedure of preparing a steam train for use - quite different to just flicking the switch on an electric train. The train featured is not actually a Puffing Billy locomotive, but a larger version. The clip shows a driver lighting the engine's boiler, checking and oiling its wheels and other standard tasks.

The multi-choice challenge requires the students to note the various tasks and then select the first job the driver had to carry out in the locomotive's preparation. (Lighting the boiler.)

#### **Possible discussion points;**

- The differences between steam power and other forms of propulsion.
- How steam can be used to generate electricity.
- The harder workload on train drivers in the past.
- The pollution aspects of steam versus electric trains.

#### **Possible classroom or homework activities:**

- Draw a simple diagram to illustrate the way in which steam can produce propulsion.
- Research what other types of machine were once powered by steam.

## 2) BELGRAVE

The small town of Belgrave is where Puffing Billy begins its run. The film clip begins with a sign describing how the train depends on volunteers to operate. We then see various local people at their daily jobs. These same people are then shown in their volunteer roles at the railway.

Students have to take note of the actual and voluntary jobs of the people featured in the clip. They then use their mouse to match up the pairs of jobs. One of the men featured in the clip is some sort of draftsman. Students may need to be prepared for this vocabulary.

The correct answers are:

The SCHOOL TEACHER works as a TICKET INSPECTOR.

The HAIRDRESSER works IN THE KIOSK

The DOCTOR helps CLEAN THE LOCOMOTIVE

The DRAFTSMAN works as a PLATFORM GUARD.

### Possible discussion points:

- The importance of volunteer organisations.
- Whether students or their families are involved in voluntary organisations.
- What voluntary organisations exist in the students' community?
- What jobs would students be interested in if they worked on the Puffing Billy Railway?

### Possible classroom/homework activities:

- Make a list of voluntary organisations in your local community. Are there any historical preservation societies?
- Research a voluntary group.
- Research the numbers of people involved in volunteer work in Australia. What are some of the biggest organisations?

### **3) MENZIES CREEK**

This township along the line is typical of those that the original railway line helped settle. The clip shows children from the 1960's travelling on Puffing Billy. Students may be intrigued by the apparently lax safety standards of the time, with children hanging their heads and other body parts out of the open windows.

Further to the examination of a steam locomotive in the first challenge, the multi-choice question following this clip asks students to speculate on what the different clouds of gas coming out of the locomotive are. The thick, black cloud is coal smoke, whilst the smaller, white cloud is excess steam. Steam is also emitted from the whistle.

#### **Possible discussion points:**

- The pollution aspects of steam trains and the health risks to the drivers.
- The unpleasant drawbacks of travelling through a long tunnel!
- The work involved in keeping the boiler fuelled.
- The limitations placed upon the range of steam trains and the need for re-supply.
- Why did trains need a whistle?
- Besides coal, what other fuels could be used to fire a boiler?

#### **Possible classroom/homework activities:**

- Research how a steam whistle works.
- Research how much coal and water were required to operate a steam locomotive.

#### **4) IN THE FOREST**

The journey aboard Puffing Billy winds through some spectacular forest scenery. Indeed, logging was one of the industries that the original rail line supported. As wood was in abundant supply it was a handy construction material for the railway, as evidenced by the spectacular trestle bridge that is still in use.

In this challenge, students use their mouse to drag jigsaw pieces together and complete a picture of Puffing Billy crossing the bridge.

#### **Possible discussion points:**

- Why do railway lines often require lengthy bridges, even when there is no water to cross?
- Changing attitudes to logging.

#### **Possible classroom/homework activities:**

- Research bridges. What types are there? What are some of the record-holding bridges around the world?
- Research logging in Australia. What areas are/were major sources of timber?

## 5) AT THE CONTROLS

The video clip for this challenge demonstrates the various controls a driver had to manage on a steam locomotive. The clip has been edited slightly to reduce the complexity and amount of information. Students will need to take some notes from the clip, using the video control buttons to replay information as required.

Some of this vocabulary will then be utilised in a hidden word challenge. The key words are GLASS, REGULATOR, ASH, WATER and BACKWARDS. These words must be put in the correct places (with correct spelling) in order to spell out the mystery word "GUARD" running vertically.

### **Possible discussion points:**

- What sort of demands were there on a steam train driver compared to the train drivers of today?
- How hard must it have been to stop quickly when so many systems had to be managed?

### **Possible classroom/homework activities:**

- List the different sorts of energy used to power trains.
- What are the factors that make it easier for a train to come to a halt over a shorter distance?

## 6) EMERALD

This clip is a fun way of pointing out that as well as being complicated, driving a steam train was hard work physically. The constant need to shovel coal whilst exposed to the heat of the furnace and the weather, as well as needing to load fuel and water aboard at stops made for a tiring day.

In the clip, (not shot on Puffing Billy) two engineers are shown cooking their breakfast in the locomotive cab. Students must answer a multi-choice question about what implement they were using to fry their bacon and eggs. (The coal shovel.)

### **Possible discussion points:**

- What were some of the unpleasant aspects of driving a steam train?
- What were some of the health risks?
- What level of teamwork would be required?

### **Possible classroom/homework activities:**

- Research the health risks associated with burning coal.
- Design a meal meant to be cooked only on a shovel.

## **7) LAKESIDE**

The challenge is a simple video game that has students helping to load Puffing Billy with coal. There is no set maximum score they must obtain. It is intended that whilst being fun, this challenge will also get students thinking about the amount of energy required to run a steam train. Note that the game will prompt students to move on if they do spend too long playing it.

### **Suggested discussion areas:**

- Were steam trains more or less polluting than modern diesel and electric locomotives?
- Why do you think we no longer use steam trains?

### **Suggested classroom/homework activities:**

- Research fuel consumption of diesel locomotives compared to steam trains. Make a judgement about which type is more efficient.

## 8) GEMBROOK

The final challenge for this journey looks at the language associated with steam trains that has entered our everyday lives. After looking at some pictures of Puffing Billy, students will be asked a multi-choice question, asking them which of the following phrases IS NOT related to steam locomotives:

The phrases are:

- a) To build up steam.
- b) To be puffed out.
- c) To let off steam.
- d) To run out of steam.

Option b) is the correct answer, since this phrase is derived from the notion of someone being out of breath. The other three phrases are all related to steam engines.

### **Possible discussion points:**

- What other common phrases can you think of that relate to trains?
- What phrases are related to transport?

### **Possible homework/classroom activities:**

- Investigate the real meaning of phrases like “build up steam” or “let off steam”. Prepare an explanation.

**After a correct answer for this challenge, the student will have completed this module and will be able to print off a certificate as proof of completing the Puffing Billy journey.**