This section aims to teach students how sexual activity can lead to the spread of microbes and disease.

Section 2.3, Sexually Transmitted Infections, teaches students how easily potentially harmful microbes can transfer to the person you care about without either of you knowing. Students carry out a chemical experiment to see how many people can be infected unknowingly by unprotected sexual intercourse and how we can prevent this from happening.

A comic strip forms the basis of the extension activity. Each scene of the comic strip sees our two main characters, Amy and Harry, making some good and bad decisions. The students then discuss just how wise these decisions are and how relevant they are to them.

LEARNING OUTCOMES

- All students:
  - Will know that infection can be spread easily through sexual contact
  - Will understand what they can do to protect themselves against STIs

NATIONAL CURRICULUM LINKS

- Key Stage 3
  - Science
  - Working Scientifically
  - Experimental skills and investigations
  - Analysis and Evaluation
  - PSHE
  - Core Theme 1: Health and Wellbeing

Estimated Teaching Time
50 minutes
2.3 Spread of Infection
Sexually Transmitted Infections (STIs)

**Key Words**
AIDS
Anal sex
Chlamydia
Genital warts
Gonorrhoea
Hepatitis B
Herpes
HIV
Oral sex
Sex
STI
Syphilis
Transmission

**Materials Required**
Per student
- □ 3 clean test tubes
- □ Copy of SW 1
- □ Copy of SH 1
- □ Copy of SH 2

Per class
- □ Test tube rack
- □ Iodine
- □ Starch
- □ Water
- □ Gloves
- □ Cling film or cotton balls

**Background Information**

STIs are infections contracted by having close sexual contact with someone who is already infected. Some STIs can be treated and cured with antibiotic medicine whereas others cannot. Many incurable STIs can be treated to make them easier to live with. There are over 25 different STIs.

Bacterial STIs are caused when bacteria are spread through vaginal, oral or anal sexual contact with an infected person. These infections include chlamydia, gonorrhoea and syphilis and are generally cured through antibiotic therapy.

Viral infections can be spread via the same routes as bacterial infections but can also be spread through direct contact with infected skin or bodily fluids such as blood, semen or saliva from an infected person entering into the bloodstream of an uninfected person. Viral infections include genital warts, hepatitis B, herpes and HIV which although they can be treated, are NOT curable.

Although most STIs are generally transmitted through sexual encounters, some STIs can be spread to others by sharing needles and syringes, through skin to skin contact (in the same way that bacteria can spread from one person’s hand to another) or are transferred from mother to unborn baby during pregnancy and childbirth. HIV can also be spread through breast milk.

Details on the most common STIs are available in the PowerPoint presentation on the e-Bug web page although it is important to note that people can have an STI but have NO obvious symptoms; they themselves may not know they are infected.

Anyone can contract an STI. It has nothing to do with how ‘clean’ someone is or how the person dresses and acts. Most people who contract an STI do not know that the person they have sexual intercourse with is infected.

**Advance Preparation**

1a. Half-fill a test-tube with water – one per student
1b. Replace one of the test-tubes with starch
2a. Half-fill a second set of test-tubes with water
2b. Replace one of the test-tubes with starch
3a. Fill 4 test-tubes with water
3b. Place cotton plugs or cling film over the top of 2 of the test tubes
4. Photocopy SW 1 for each student

**Available Web Resources**
- A demonstration film of this activity.
- A MS PowerPoint presentation to aid the teaching of this topic.
- SH 1 and SH 2 as MS PowerPoint

**NOTE** This activity can be used to demonstrate the spread of other types of infection, visit Section 2.2 to see how it can be used to demonstrate the spread of a flu virus!
2.3 Transfer of Infection
Sexually Transmitted Infections (STIs)

Lesson Plan

Introduction

1. Begin the lesson by explaining to students that there are many ways in which microbes can be transmitted, e.g. touch, sneezing or through contaminated food or drinking water. Highlight that another important route of transmission is through the exchange of bodily fluid, i.e. unprotected sexual intercourse.

2. To prevent students being shy about the topic, ask if they have ever heard of any STIs and if they know what causes them. Use the PowerPoint activity found at www.e-bug.eu to help explain this.

3. Explain that STIs are generally transmitted through unprotected sexual contact i.e. not using a condom, although in some instances transmission can be through ‘dirty needles’, skin contact, or from mother to unborn child and through breast milk. This is because some STIs are carried in the blood and transmission of this bodily fluid can also transmit the infection.

4. EMPHASISE that non-barrier forms of birth control, e.g. the contraceptive pill, DO NOT protect against STIs.

Main Activity

1. This activity is best carried out as a class exercise.

   Section A

2. Explain to the students that they will be simulating sexual contact by exchanging fluid (representing bodily fluid) between the two test tubes. Pass the test tubes around the class making sure that each student gets a test tube full of fluid. DO NOT let the students know that one of the test-tubes contains starch, although the teacher should know who has the test tube. NOTE It may be important to select a student to take the test tube who will not be ‘picked on’ by the other students when they realise they have been the ‘carrier’.

3. Tell each student that they must exchange fluid with 5 other students (for a class smaller than 25 reduce the number of exchanges to 3 or 4). Emphasise to students that they must remember who they exchanged fluids with and in what order; they will then need to write this down later on SW 1. Prompt students to mix outside their normal group of friends and encourage mixing between boys and girls.

4. When finished, provide students with a copy of SW 1. Tell the class that one of them carried fluid which contained a simulated STI. The teacher should go around the class testing for the STI by adding a drop of iodine to each test tube. If the fluid turns black that person was infected. Can the class figure out who the original infected person was?

   Section B

5. Repeat the activity by reducing the number of times students exchange fluid (have sexual encounters) to 1 or 2. Does the class notice the decrease in the number of infected people?

   Section C

6. Choose 5 people from the class to do a demonstration. Show the class which student has the ‘infected’ test tube. Provide the other 4 students with the remaining test tubes, 2 of which are covered in cling film.

7. Ask the ‘infected’ student to have a ‘sexual encounter’ with each of the five other students in turn. NB Do not mix fluids this time, simply let the infected student drop some of their fluid into the other test tubes using a dropper, the recipient must mix the sample well.

8. Test each of the student samples for an STI using the iodine.

9. Indicate that during these sexual encounters the cling film represented a condom and that these students didn’t contract the infection.
2.3 Transfer of Infection
Sexually Transmitted Infections (STIs)

Lesson Plan

Plenary
Check for understanding by asking the students the following questions:

a. What is an STI?
   Sexually Transmitted Infections (STIs) are infections which are mainly passed from one person to
   another (that is transmitted) during sexual contact. There are at least 25 different STIs with a range
   of different symptoms. These diseases may be spread through vaginal, anal or oral sex.

b. Who can contract STIs?
   Anyone who has had unprotected sex with someone who has an STI can contract an STI. STIs are
   NOT exclusive to people who you may consider to be ‘easy’, prostitutes, homosexuals or drug
   addicts. You only need to have a sexual encounter with an infected person once to contract the
   infection.

c. How can we reduce the risk of contracting an STI?
   There are a number of ways to prevent contracting an STI.
   i. Abstinence: The only sure way to prevent contracting an STI is not to have oral, anal or vaginal
      sexual contact.
   ii. Use condoms: Condoms are the recommended preventative measure, however, condoms only
       protect the skin they cover, any sores or warts found on the genital region not covered by the
       condom can still spread to another person’s skin.
   iii. Talk to your partner: Talk to your partner about safer sex practices, for example, using a condom. If
       you have a new partner discuss the option of you both being tested for an STI before committing to
       a sexual relationship.
   iv. Get yourself tested and have regular check ups: When sexually active, even if you do not appear to
       have any symptoms, it is still very important to have regular tests and check ups to make sure you do
       not have an infection. Not all STIs show symptoms at first, if at all.

d. Do other birth control measures, other than the condom, protect against STIs?
   NO. The birth control measures only protect against pregnancy, they will NOT protect against
   contracting an STI.

e. What are the symptoms of an STI?
   Symptoms of sexually transmitted infections vary, but the most common are soreness, unusual
   lumps or sores, itching, pain when urinating, and/or an unusual discharge from the genital region.

f. Does everyone who contracts an STI show symptoms?
   NO, STIs are a common problem because many people are carriers of the infection without realising
   it. In some cases, women do not realise they have been carriers until they show infertility problems
   in later life.

g. Where can I go for further advice and be tested?
   Ask your school nurse or General Practitioner (GP).

Extension Activity

a. Produce posters educating the general public on STIs.

   OR

b. Provide students with a copy of SH 1 and SH 2 and ask them to comment on the statement being
   made in each of the cartoons. This can be completed as either an individual or group activity or a
   classroom discussion.
2.3 Spread of Infection
Sexually Transmitted Infections (STIs)

If Harry has had unprotected sex with other people there is a possibility that he may have contracted a sexually transmitted infection. Many STIs do not show any obvious symptoms and as such, Harry may not know whether or not he has contracted a STI. He may love Amy but only through regular screening and having protected sex can he be sure not to give her an infection.

Amy is making a very bad decision. Using a condom helps not only in reducing the risk of pregnancy but also in reducing the risk of contracting an STI. Many pregnancies and STIs have happened to people who thought, "It'll be all right just this once."

In this scene Amy and Harry appear to be very sensible by using the contraceptive pill to help prevent unwanted pregnancies. It must however be remembered that the pill and implants are only a contraceptive medication, they will not help prevent contracting an STI.

Many people, no matter what age, may feel embarrassed about attending their GP, school nurse or GUM clinic. It is important to emphasise to students that there is NOTHING to be embarrassed about. Contracting an STI and not getting treated, or transferring an STI to someone you care about could be a lot more embarrassing and have painful results.

This is a common myth amongst teenagers and many adults. Anyone can contract an STI at any time from someone who is already infected if they don’t use the proper precautions.

It is important to emphasise to students that STIs are an increasing problem. Unfortunately Chlamydia is one of the most common STIs amongst young people today, mainly because those infected show little or no symptoms at the beginning. Chlamydia can however still cause infertility in later life.
Examine each of the scenarios. What is your opinion of the conversations taking place?

**1. I love you. I wouldn’t give you an infection**

Amy and Harry are discussing their potential sex life. Harry has had other partners and Amy is slightly concerned about the possibility of contracting an STI.

**2. Just this once won’t do any harm, don’t worry about it**

Harry and Amy are worried that they don’t have a condom.

**3. We already use birth control**

Do Amy and Harry need to buy condoms?
Examine each of the scenarios. What is your opinion of the conversations taking place?

4.

Harry is extremely embarrassed about visiting the GUM (Genito Urinary Medicine) clinic with Amy.

I think we should start sleeping together but I’d like you to get tested first.

5.

I heard you can’t catch it your first time.

Amy and Julia are discussing what it would be like the ‘first time’, and are worried about herpes.

6.

Harry and Sandy are talking about their sexual education class and are discussing Chlamydia.

Chlamydia! They only go on about that to stop us having fun.
## Section A

List the people who you had a ‘sexual encounter’ with and whether or not they had the STI:

<table>
<thead>
<tr>
<th>Sexual encounter</th>
<th>Name of person</th>
<th>Were they infected?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How many people in the class contracted the infection? ____________________________

Did you contract the infection? ________________________________________________

Who was the carrier of the infection? __________________________________________

## Section B

List the people who you had a ‘sexual encounter’ with and whether or not they had the STI:

<table>
<thead>
<tr>
<th>Sexual encounter</th>
<th>Name of person</th>
<th>Were they infected?</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How many people in the class contracted the infection? ____________________________

Did you contract the infection? ________________________________________________

Why was there a reduction in the number of people who contracted the infection this time?
____________________________________________________________________________

Who was the carrier of the infection? __________________________________________

## Section C – Results

<table>
<thead>
<tr>
<th>Person</th>
<th>Colour before</th>
<th>Colour after</th>
<th>Reason for colour change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What does the cling film or cotton balls represent?
____________________________________________________________________________

Can you think of any reasons why some of the people didn’t get infected even though they had a sexual encounter with someone who had an STI?
____________________________________________________________________________