

MINUTES OF THE e-Bug INFORMATION DISSEMINATION MEETING

Held at
The Hotel Pyramida, Prague on 23/24 April 2007

Chair: UK Clodna McNulty, Lead Partner

Present:

Belgium	Herman Goossens, Audit Committee Chair
Belgium	Stijn de Corte, Belgian Antibiotic Policy Coordination Cte
Croatia	Arjana Tambic Andrusevic
Croatia	Andrea Tomljenovic, Ministry of Education
Czech Republic	Jiri Benes
Czech Republic	Teresa Herotova
Denmark	Dominique Monnet
Denmark	Jette Holt
France	Pierre Dellamonica, Implementation Lead
France	Pia Touboul
France	Jean-Louis Michard, Ministry of Education
Greece	Koula Merakou (representing Jenny Kourea-Kremastinou)
Greece	Dimitra Gennimata
Hungary	Gabor Ternak
Ireland	Robert Cunney
Italy	Giuseppe Cornaglia
Italy	Raffaella Konkan
Latvia	Sandra Berzina
Latvia	Laine Saule, Latvia
Lithuania	Rolanda Valinteliene
Lithuania	Asta Palekauskaite
Poland	Anna Olczak (representing Pawel Grzesiowski)
Portugal	Antonio Brito Avo
Slovenia	Marko Pokorn
Spain	José Campos
UK	Donna Lecky, e-Bug Pack Designer
UK	Patty Kostkova, e-Bug Web Lead
UK	David Farrell, e-Bug Web Designer
UK	Jill Whiting, PA to Clodna McNulty
UK	Diane Stallabrass, e-Bug Lead Administrator

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In attendance: Eva Maratova, College of Education, Charles University, Prague
Olga Panosova, Elementary School Teacher, Prague
Hugh Lamont, HPA, UK
Jenefer Williams, UK Primary School Teacher
Sarah Bravington, UK Secondary School Teacher
Hugh Williams, UK Secondary School Head of Science Teacher
Jo Lewthwaite, UK Secondary School Teacher
Janet Hurst, SGM Education Co-ordinator, UK

Apologies: Julius Weinberg, Evaluation Lead, UK
Pentii Huovinen, Finland
Tomas Tesar, Slovakia

Minutes: Diane Stallabrass

1 Introduction to Meeting

Jiri Benes, Associate Partner for the Czech Republic began by expressing his pleasure in welcoming all delegates to Prague. He hoped all would enjoy the meeting and have the opportunity to discover something of the beauty of his historic home city in glorious sunshine.

Clodna McNulty (CMcN) then made a short address welcoming all delegates representing a wide range of expertise from the medical and scientific community, infection control and surveillance agencies, education and the teaching profession. She offered a special welcome to all Collaborating Partners for whom it was their first e-Bug meeting and to all the working guests who would be facilitating break-out groups during workshop sessions. She also gave a special mention to Antonio Brito Avo, who was attending with a view to taking over the role of Associated Beneficiary for Portugal. Delegates were then all introduced individually.

It was noted that Powerpoint presentations used at the meeting are posted on the website to support the minutes. **Action DS**

1.1 Background of the Project

CMcN then proposed to give an update on the Project as the DG Sanco sponsored Grant Agreement No 2005211 "Development and Dissemination of a School Antibiotic and Hygiene Education Pack and Website across Europe – The e-Bug Project.

1.2 Aims of the Project

CMcN gave an overview of the Work Packages for the next three years with an objective to design and produce a pack suitable for use in junior and senior schools, with a website to complement it, and then to ensure that the pack is implemented, translated and disseminated across Europe. The pack should cover areas proposed by the EU Strategy on prudent antibiotic use, hand and respiratory hygiene to reduce infection, and use of vaccines to reduce use of antibiotics. She highlighted the contractually agreed time lines for the Project starting June 06 and ending in September 09 with a final presentation to collaborating countries in May 09.

1.3 Deliverables of each Work Package

CMcN reminded delegates that the EU has formulated an agreed number of Work Packages for the Project and agreed Deliverables within each of these. Certain Partners have agreed to be the Lead on producing the Deliverables of each Work Package (i.e WPs 1, 4, 5 Clodna McNulty, WPs 2 and 6 Patty Kostkova, WP 3 Julius Weinberg and WP7 Pierre Dellamonica). A strict requirement dictates that these should be met by the agreed deadlines in order to secure the EU funding. A Powerpoint presentation gave an overview of the content of each the work packages and the deadline for the deliverables.

WP 4 (Background Research) is almost complete and a written report is due for June 2007 from each Associate Partner covering the school curriculum, public education campaigns, public or school websites, pattern of antibiotic use, countries' culture or customs and stakeholders in health and education. The results of the Research Questionnaire would be shown later in the meeting.

WP 5 with a deliverable of March 2008 would be the next phase with Pack Design and Development being influenced by the results of the research period and present meeting.

WP 6 with a deliverable of March 2008 is ongoing with Website Design and Development underway and a range of web-based activities in plan to complement and extend the activities in the pack.

WP 7 with a deliverable of August 2009 was in the control of PD to develop appropriate translation and implementation in each country with a pilot version in Spain and Italy. All would need to be ratified by the Ministry of Health and Education in each country.

WPs 1, 2 and 3 are common to all DGSanco projects and CMcN stated that she was acting as the Lead Partner in co-ordinating the Project and facilitating communication between all partners (WP1). It would be her responsibility to record progress, set targets, produce timely reports, address any problems and report officially to the Audit Committee.

PK was responsible for WP 2, Dissemination of Results, and she had already developed the e-Bug website for this purpose to be improved and expanded over the next 2 years at www.e-bug.eu. The purpose of the present meeting was also to discuss and disseminate the findings of the Project so far.

JW was responsible for WP 3, Evaluation, to include regular Audit meetings (chaired by Herman Goossens) to monitor the progress of the Project and to evaluate the pack. Evaluating countries had already been established, namely UK, CZ and FR to evaluate the pack during development, assess its impact on knowledge and attitude and arrange modifications as necessary.

1.4 Aims of the Meeting

CMcN outlined the objectives for the two days as the opportunity for delegates to:

- Meet and network with partners
- Familiarise themselves with the project i.e. budget and work packages
- Clarify their own specific role and what partners should contribute
- Clarify all essential administrative procedures
- Discuss and review the findings of the last 9 months research period
- Discuss the pack and website content in break out sessions.

She emphasised the need to be enthusiastic and participate in the breakout sessions.

2 Results of the Research Period

Donna Lecky and David Farrell made a joint presentation outlining the findings of the past 9 months and thanked all those who had contributed to that research period which had explored the following areas in each Associate Partner country:

- The science school curriculum content
- Public antibiotic or hand hygiene campaigns and existing websites
- Pattern of antibiotic use, infectious disease and countries' customs and cultures
- Details of stakeholders who would be interested in the use and dissemination of the pack
- Details of other pan-European Campaigns

Methods used were questionnaires for an overview of all countries, UK teacher focus groups to ascertain the level of detail and appropriate content for the packs and website and a search of the internet for resources and information.

Objectives were to decide where and how e-Bug would fit into the curriculum by examining the educational structure across each Associate Partner country and assessing what children are taught with regard to good and bad microbes, hand and respiratory hygiene, antibiotic use and vaccines.

2.1 Education in Europe

Posters to demonstrate in graphic format the variations in the Education Structure across Europe had been produced for display at the meeting.

The slide display also demonstrated all the findings but essentially conclusions were as follows with Partner comments appearing in Italics:

- e-Bug would fit junior (age 9-11) and a majority of senior school children (age 12 - 14). After age 14, in some countries, education choices tend to diverge and a majority may not be studying science. It may be necessary to modify the target age for packs accordingly for each country. Age 13-15 was agreed.

The older age group could perhaps be flexible - it might be better to target 13-15 year olds as they are more mature and we can aim at depth of knowledge at this age. Or should we start earlier with an even younger pack from age 7 rather than 9-12? Probably not as there is already much material for younger children on handwashing etc.

- the curriculum is similar across all countries but some areas for e-Bug to focus on, which are not currently taught in detail, might be the 6 steps of hand washing, the need to cover coughs and sneezes and then wash hands, a focus on the detrimental effect of overuse of antibiotics in terms of microbial resistance and the need to protect good flora.

*It is important to target behaviour in younger children.
The pack must tie into the curriculum in all areas however.*

- the emphasis of the pack should be on healthy living and good hygiene

Could those with an opportunity to teach children younger than 9-12 just use the first two parts of the junior pack – the simplest tools – to recommend good habits of hand and respiratory hygiene i.e. wash your hands and sneeze on your sleeve?

- e-learning is increasingly used with web-based games and activities and 75% of schools have access to computers across Europe. Not all have broadband and CDs may be required for some countries.

Research also revealed that the teaching would fit best into the science curriculum, but could be adapted to PHSE, Religion and Citizenship in certain countries as appropriate.

2.2 Public Campaigns

Associate Partners had been asked to provide details of national public campaigns in handwashing, antibiotics and respiratory hygiene for three target audiences: health service, general public and school age children.

The response from Partners and internet searches provided details of 58 European campaigns, which either provided detailed information or were message-based, to reinforce key points. The media used to convey the campaigns are mostly posters, folders, CDs, website and TV. Posters are the most common format. However teachers have said they receive numerous posters and usually these are thrown away. It could be wise therefore to

avoid these for e-Bug and perhaps a good idea instead to introduce poster design as a creative activity for children as part of the pack.

Handwashing: The slide presentation showed visuals of different campaigns and revealed that there was no consistency across Europe and no single character or slogan. Most campaigns are geared towards health service and children are underserved with not much focus on technique. There is a range of slogans, but it may be difficult to find one that translates successfully. "Hands up for Hygiene" is a possibility, highlighting hands and reflecting the school room with a familiar gesture for children at school.

Not all delegates feel at ease with the idea of Hands Up for Hygiene. Although it is a common expected action in all classrooms across all countries, it could have a perceived association with police hold-ups or during the war. It might be better to use "put your hand up for hygiene".

Antibiotics: The slide presentations showed visuals of different campaigns and revealed that again children are underserved with only The Bug Investigators Pack in the UK. The focus on bacterial vs viral infection is confusing for the general public and the important message to convey is that antibiotics do not work on colds and flu, overuse makes them ineffective and the course should always be completed.

Respiratory Hygiene: The slide presentation showed visuals of different campaigns, mostly aimed at the general public e.g. flu vaccine for older people and information on colds and flu. There were few campaigns about covering the mouth when coughing and sneezing and no iconic logo or slogan. A possibility to develop might be "sneeze on your sleeve" promoting an action and a message i.e. not on your hands which might spread more infection.

*Not all delegates at ease with the "sneeze on your sleeve" concept. Dependent on countries' cultures, it could be seen as unpleasant, impolite, mothers may not like the idea and there could be danger of virus surviving on material. The rationale will be checked with CDC Atlanta who are already using this message. **Action DL, CMcN**
It might be preferable to recommend "sneeze in a tissue" (even sponsorship from tissue manufacturers?) but the essential message is to throw tissue away and then wash hands.*

Summary: Across all the campaigns reviewed, there was no common look, no single defining character or slogan, only one national campaign aimed at pupils in antibiotic usage (Bug Investigators) and few message-based respiratory hygiene campaigns that focus on spread of infection.

All ideas for differentiation of activities must be included in the teacher handbook or appear on the website.

There should be a pack for Directors of Schools to gain buy in to the messages.

There should be key messages which should be consistent throughout.

2.3 Pattern of antibiotic use

Associate Partners were asked to give details of patterns of antibiotic usage, population dynamics and infection. Findings were as follows:

Antibiotic use:

In all countries (except Greece) antibiotics are only available on prescription, with limited over the counter sales of very limited topical antibiotic in UK and Poland.

In all countries there is no advertising to the public.

Patient pressure came across as one of the more significant reasons for oversubscribing of antibiotics, according to questionnaire responses.

Population dynamics:

Across Europe there is a significant mix of race and therefore a need to ensure these are represented in any human images in e-Bug.

All countries teach the local main language to children in school, so there should be no need for multiple language versions of e-Bug, except in Belgium.

Infection:

There is no common theme relevant for e-Bug, but packs may be tailored to recent outbreaks in individual countries.

Should we talk about the difference between virus and bacteria when teaching prudent use of antibiotics or severity of infections? Or is this too simplified? Perhaps it is better to look at syndromes and the concept of risk. Most of the time there is no risk. Parents will decide of course but the objective is to educate a future generation of parents.

2.4 Stakeholders

During the Pack Development Stage Partners should focus on Ministries of Health and Education and gaining input from teachers and schools to ensure that key messages are being reinforced and that the pack will attract ultimate endorsement from these very important stakeholders.

During the Pack Implementation Stage Partners should focus on schools and teachers to ensure their “buy-in”, education shows to promote the pack and influence large audiences, school outreach programmes to target specific schools and Microbiological Societies to tie into their education campaigns.

2.5 Pan European Campaigns

For information some pan-European health campaigns were highlighted on the slide presentation and specifically some pan-European Education campaigns, which might help inform the e-Bug programme.

Most important would be Red Cross European Road Safety www.1-life.info/2003/info aimed at children and has been successful for the past 4 years. It could be worth contacting them because they work with our target audience and have been successful. They are also EU commission.

The following could be important for dissemination purposes as they are already working with schools in Europe in a collaborative capacity

- CALIBRATE
 - supporting the collaborative use and exchange of learning resources in schools
- Eurydice
 - Information network on education in Europe
- Insight
 - Examining e-learning across Europe
- My Europe
 - Community of over 6000 schools learning about what it means to be European

2.6 Conclusions

Based on the findings of the research period the suggested pack layout is as follows and is open to comment:

It is proposed that the pack should:

- Be modified to suit the needs of each country
- Be concentrated on science but also be cross-curricular i.e. science, PHSE, citizenship
- Be differentiated with a core message for all and extension tasks for the more able
- Have everything available on the web for download
- Have activities available as pdf and as word documents to enable teachers to modify them easily for specific classes.

It is proposed that the web should include:

- Downloadable clip art/animations to create a feeling of ownership for children
- Competitive quizzes
- Games
- Certificates of achievement
- An element of evaluation within the games to show how children use them
- Online activities lasting 10 minutes
- Online activities suitable for home or class use
- Games with multiplayer facility which children especially enjoy

It is proposed that the teacher section should contain:

- Lesson plans
- Learning objectives
- Classroom presentations
- All resource material (classroom activities, games, etc)
- Background notes (reasons for activities, alternative ideas etc).

It is proposed that the student section should contain:

- Classroom resource material/information sheets
- Did you know? sections
- Games for home or school use
- Revision guides

The suggested Pack Structure for Junior Schools, which was then discussed in the break-out sessions, should be as follows:

Topic 1 – Introduction to Microbes

Key messages:

- There are different types of microbes
- They all differ in size
- They are found everywhere

Topic 2 – Good bacteria

Key messages:

- Not all bacteria are bad
- We use good bacteria to help us

Topic 3 – Bad bacteria

Key messages

- There are many different types of bad bacteria
- They all work in different ways

Topic 4 – Prevention of Disease

Key messages

- Wash your hands
- Sneeze on your sleeve
- Do not use antibiotics for colds or flu

The Pack Structure for Senior Schools should be as follows:

Topic 1 – Introduction to Microbes

Key Messages

- There are different types of microbes
- They all differ in size and shape

Topic 2 – Useful Bacteria

Key Messages

- Not all bacteria are bad
- Good microbes can fight bad microbes
- We need microbes to survive

Topic 3 – Spread of Disease

Key Messages

- There are different types of disease
- Disease can spread through air and touch

Topic 4 – Prevention of Disease

Key Messages

- The body is the first line of defence
- Wash your hands
- Sneeze on your sleeve

Topic 5 – Antibiotics

- Key Messages
- Antibiotics do NOT work on viruses
- Prudent antibiotic use

Topic 6 – Vaccines

Key Messages

- Vaccinations are use for viral infections

Delegates were then asked to comment on the findings and the proposed layout for the pack and comments have been recorded in italics above.

3 Workshop Sessions

Delegates were divided into working groups to review a range of possible activities for the Junior Pack and website. For each activity they were asked to consider the following:

- Are the key messages correct?
- How does this activity cover one of the key messages?
- Is it at the correct level for this age group?
- Is it practical in schools?
- How can it be improved?
- Suggest another activity covering the key messages?

Outcomes of the working groups are recorded in **Appendix I**.

A discussion to review the key messages followed the Junior School Workshop Sessions and the new agreed key messages for junior school children age 9-11 are as follows:

Introduction to microbes

- Different types: virus; bacteria; fungi
- They are found everywhere even though you can't see them

Good microbes

- Most microbes are good for us
 - Good bacteria help keep us healthy
 - They can be put to good use

Bad microbes

- Sometimes microbes can make us sick

Prevention of disease

- Prevention when possible is better than cure (treatment)
- Keep your bad microbes to yourself
- Our body helps defend against microbes

Hand hygiene

- Wash your hands (once, twice)
 - How
 - When

Respiratory hygiene

- Cover your coughs and sneezes
 - (Sneeze in your sleeve or equivalent)

Vaccines

- Vaccines are important to prevent a range of infections
- There are not vaccines for all infections

Antibiotics

- Most common infections get better on their own
 - Sometimes your doctor needs to give you an antibiotic
- If you have antibiotics, finish the course

The meeting closed at 18.00h but there is an opportunity to comment on these over the next two weeks.

Day 2 – The Senior School Pack

Delegates were divided into working groups to review a range of possible activities for the Senior School Pack and website. For each activity they were asked to consider the following:

- Are the key messages correct?
- How does this activity cover one of the key messages?
- Is it at the correct level for this age group?
- Is it practical in schools?
- How can it be improved?
- Suggest another activity covering the key messages?

Outcomes of the working groups are recorded elsewhere in **Appendix II**.

A discussion to review the key messages followed the Senior School Workshop Sessions and the new agreed key messages for senior school children age 13-15 are as follows:

Introduction to microbes

- Different types: virus; bacteria; fungi
- They are found everywhere even though you can't see them

Good microbes

- Most microbes are good for us
 - Good bacteria help keep us healthy
 - They can be put to good use
- We need bacterial colonisation to live a healthy life (normal flora)
- Protect your normal flora

Spread of infection

- Sometimes microbes can make us sick

Prevention of disease

- prevention when possible is better than cure (treatment)
- Don't spread your bad microbes to others
- Our body helps defend against microbes

Hand hygiene

- Wash your hands
 - How (warm water / soap)
 - When
 - Why

Respiratory hygiene

- Cover your coughs and sneezes
 - (sneeze on your sleeve or equivalent) (tissue) (country dependent?)

Vaccines (move to prevention heading)

- vaccines are important to prevent a range of viral and bacterial infections
- there are not vaccines for all infections

Antibiotics

- Most common infections get better on their own
 - Sometimes your doctor needs to give you an antibiotic
- If you have antibiotics, finish the course
- Do not use leftover antibiotics or other people's antibiotics
- Antibiotics are special medicines designed to cure bacterial infections but not viral infections
- Overuse of antibiotics can lead to antibiotic resistance in bacteria and affect our normal flora
- Bacteria are becoming resistant to many antibiotics due to antibiotic overuse and misuse

Comments were made on the suitability/feasibility of some of the activities also and notes were made as to how these should be improved to be more age appropriate, take more account of health and safety and do more to promote healthy living to protect natural flora.

Partners should send any comments about the key messages or ideas for activities as soon as possible to CMcN and DL. **Action All Partners**

4 Partners' Roles

CMcN gave a short presentation on the role of Associate and Collaborating Partners.

She reiterated the need to establish key stakeholders, particularly the Ministry of Health and the Ministry of Education, local schools to assist with the development stage and others such as antibiotic resistance committees, etc

She confirmed that draft resources would be developed over the next 4 months and would be sent out for comment by October/November 2008 following an initial trial of activities in the UK.

The final pack would be ready in March 2008 and it would be essential to co-ordinate and organise translation of the pack at this point. Associate Partners should have a member of staff identified to do this and there is a sum allocated within the budget for each country for e-Bug to finance this individual. (See your financial summary for details).

CMcN emphasised again the need to obtain endorsement for the Pack from the Ministry of Health in each country, without which it may not be implemented in schools and the funding from DGSanco would consequently not be forthcoming.

She sought support from all Partners in the dissemination of resources. CMcN encouraged them to publish information or circulate any resources, or present at meetings etc, but asked that the Lead Partner be kept fully informed of this activity.

CMcN then made a short presentation directed specifically at Associate Partners reminding them to:

- ensure that their Administrator is in place and to inform Diane Stallabrass of the name of this individual. This person is part of each country's financial contribution.
- produce an audit of their costs and days worked using the official timesheet to be submitted to Diane Stallabrass by 1 August. All details are outlined in the Finance FAQs enclosed within the delegate pack for Associate Partners. The expected number of days for the 3 years is given in each Partner's summary of costs sheet.
- identify 2 reviewers employed by Associate Partner Institute and advise their names to Diane Stallabrass. Reviewers are not funded but must be on the Institute payroll and form part of the Associate Partner's 40% contribution. This is 20 days in total from September 07 to May 09.
- determine whether an external peer review is required to improve kudos of pack (e.g. National Committees involved on antibiotic resistance). This cannot be funded but it is possible to gain sponsorship to cover the cost.
- appoint a translator and disseminator by March 08 who will be paid by the Project with the sum identified in the summary of costs for each country.
- co-ordinate the printing of packs by April 09 – the cost incurred for this is the responsibility of each country or sponsorship.

- organise a dissemination meeting in their own country. A cost for one meeting in each country has been identified in the budget and an amount is detailed in each Partner's summary of costs sheet.

5 Date of Next Meeting and Any Other Business

Teleconference No 3 for Associate Partners is scheduled to take place on Monday 4 June at 11.30 am British Time.

Other proposed dates for the diary will be circulated and confirmed in due course. There will be a 4th teleconference in September 07, a meeting for all Associate Partners in March 08 and a launch meeting for all Partners in June 09.

FAQ: Can we obtain sponsorship for packs? Can Sponsors be named on the packs?

Answer: Yes it is possible to obtain sponsorship. The company's logo can be on the back of the pack but the company cannot have input into the pack content.

CMcN closed the meeting at 13.00h thanking all delegates for their contribution, DL and DF for their hard work on reviewing the research data and presenting the findings, Jill Whiting for her assistance with the initial grant application and Jill and Diane for their administrative input. Special thanks however were extended to Jiri Benes and Tereza Herotova for their warm welcome to Prague and specifically Tereza for her help in organising the event. She was presented with flowers as a token of appreciation.

Appendix I – Comments from Junior School Break-Out Groups

Please note this is an exact transcript of notes taken during the meeting

Introduction to Microbes

Group 1

- Need to know that they are too small to see without a microscope
- The key message needs to be covered that they are everywhere even though you can't see them
- Raffaella says a comparative scale activity (town / football pitch / seat / person etc)
- Improvement: using long balloons for fungi

Group 2

- Is size important?
- The fact that there are different sizes isn't hugely important but should be mentioned
- Good for age group
- It is practical
- Sheet could be used as estimate of knowledge but not totally appropriate for lesson
- Web activity might be dull

Group 3

- 1) Some diseases are caused by germs not all. Good v Bad not that "clean-cut". Children need to know that some good can behave bad and vice versa.
- 2) No mention of microbes history during this section – they need it to complete section 2
- 3)
- 4)
- 5) Question 1a and b need to be swapped around
- 6) Activity needs to reflect key message. Suggestion of using "faces" to classify different types of germs

Group 4

Size of Microbes not important

Found Everywhere

Be explicit (body etc.), Microbial world, Colonised places

- Specific flora

Walking Zoo (suggested theme)

- Bacteria needs to be in a good place to be safe
- Bacteria are like us
 - Mix with friends
- Different bacteria according to humidity

Other

- Cover parasites?
- Good bacteria in and out of body
- Bacteria 'acting' good

- Kill bacteria by heat

Puzzle Idea (web)

- Find microbes everywhere
- Explain number of them is vast

Later Lesson

- Web cards
 - Classify by class
 - If good or bad
 - Virus / bacterium / fungi
- How to see bacteria
 - Microscope

Group 5

- Confusion between microbes and germs – define
- Germs = infectious agents (in every language)
- Start by asking why we are talking about microbes
- Good microbes – resource names products of microbes
- As example – define microbes vs products
- Ensure benign microbes (normal flora) are mentioned

Activity

- No model bacterial cut outs – only viruses
- Draw a face on microbe to show if good or bad
- Key message 3 – activity does not cover where microbes are found
- Questions to parents etc – how will these answer be discussed

Group 6

- Not consumer of probiotic but must include idea of ‘good flora’ of body – think about digestive flora – YOUR flora is good, what you come across may be harmful!
- 10X more bacteria in body than cells – normal
- Add to discussion – explain is it good (protection) or bad (fight) and why?
- Relate normal flora to your ‘pets’ occupying your body
- Images of microbes/size ‘you cannot see them’

Web activity

- Repeat question (key ones so pupils reinforce knowledge)

Group 7

Group 8

Activity

- Too much information – make it simple
 - Although UK kids would have understood
 - Big demand on teacher though
- Group work good
- Is practical
- Provide cartoon names
 - Sammy Salmonella
- Provide drawings + colour in in class
 - Or allow pupils to illustrate

Group 9

- Suggest background delayed until senior level
- Focus on a simple message like:
 - Microbes make hands dirty
 - Where bad bugs are found
 - Show you always have bugs through an activity but show that you have much more when sick
- Herman says he would have difficulty answering question
- When saying “where” found, also say how long they’d survive here
- Show good behaviour when you are sick
- Show that ‘dirty’ doesn’t mean just visible dirt
- Fungi unnecessary
- Too detailed ‘bacteria vs virus’
- Much too detailed
 - Not sure pupils would understand abstractions and see behavioral actions required.
- Suggest agar lesson or a glitter wash
- Don’t need to know the ‘whats’ at this stage – don’t need to know what these things are, just that they are there and they have some effect.

Good bacteria

Group 1

- Key message better:
 - Very few bacteria are bad
- Good idea but too optimistic – it would take much longer
- Leaves much longer than bread or fruit
- “Scientifically Suspect” – would need to check it works

Ideas

- Make yoghurt

Web Game

- Title wrong – yeast – needs to be good microbes
- Sewage works killing game good / eats / fights bad

Group 2

- Need more examples – eg human bacteria or food making or yeast
- Be careful of age though
- Need to be clear with the decay that it is bacteria causing it
- Decay is related to ‘bad’ not ‘good’ use?
- Perhaps rethink experiment
- Should have more focus on microbes rather than other factors
- Sewage works too complicated – should keep on food making

Web

- Does yeast collect sugar
- A bit to obsessed with sugar

Group 3

Question 5 & 6 Children have had no experience of microbes decaying (not enough info to answer questions 5, 6 and 8). They need some info beforehand – explanation. Do all 3 groups on separate containers – reduces cross-contamination and if the bottle is clear children will be able to see what is happening. Key messages are covered. Not all bacteria behave bad.

Group 4

- Bread
- New born child
 - No bacteria
 - Need to catch
- Flora much more important than just ‘bacteria’
- Policemen of the skin
 - Mucus
 - Respiratory tract
 - Digestion
 - Production of vitamins

Activity

- Dangerous
- Resistant bacteria
- In France, might not be allowed

- Safety consideration
 - Kids not allowed to open themselves!
- In France, how to make sausage
- Need to be careful about food cultural differences

Web Activity

- Don't make bread, make beer!
 - Although some countries might object to production of alcohol as a game
- In Bread game – green house gas is bad

Group 5

- Does not cover food science
- Good bacteria include normal flora (protective)

Activity

- Risk from fungal spores
- Too complicated (unsuitable for age group)
- Impractical
- Takes too long to get results
- Might not get expected results
- Better to make yogurt
- Key messages not met

Web

- Bread activity not clear
- Messages not conveyed
- NOTE each game should be played and tested

Suggestion


- Games showing protective bacteria fighting
- Bad microbes in the body e.g. in the gut or on the skin (football!) Teeth brushing etc
- Human ways to fight pathogens, help good 'bugs'

Group 6

- Access to specific tree leaves – use deciduous leave (not pine)
- Need to wash hands after handling
- Doesn't reinforce how this is useful
- Include the objective
- Mostly mould not bacteria
- Need a good bacteria experiment
- Make yogurt – just one day not a week
- Reinforce this contains and uses bacteria
- Can be made in a classroom
- Teacher has to eat it to show that it is good
- Talk about cheese being made the same way
- Other cultures – sour cream, shredded fermented cabbage, alcohol

Web

- Add normal digestive bacteria
- The good bacteria in my body = healthy
- When bad bacteria added = unhealthy
- Have boxes around words to show pupils what words mean
- Active learning

- Knowledge
 - Beliefs
 - Values
 - Attitudes
- 

Group 7

Group 8

Activity

- Complicated message – good + bad bacteria can be confusing
- Only 10% of bacteria are bad, rest are good
- Change activity to food production
- Not correct age / level to teach this
- Not practical from a hygiene point of view
 - Maybe in garden but city schools may not have gardens

Web Activity

- Very good
- Q's about sugar

Group 9

- Seems difficult / strange to relate composting and the human body
- Very strong feeling at the table that we need to focus more on human body
- Should be message / behaviour focused instead of info focused – and include lots of practice!

Key Message

- Bugs are necessary in areas but when they leave their area they can cause a threat

Bad bacteria

Group 1

- Is this correct nomenclature?
- Needle inoculation confusing & dangerous in class
- Not most common
- Also apple rot is fungi, not bacteria
- Impossible to do experiment to show
- Better to use images of diseases

Suggestion

- keep a diary of why people in class are sick
- or spots / infections / rashes

Web Activity

- Like the web game
- Also like the body's defences
- And putting in immune defences and vaccinations

Group 2

- Good idea for spread of bacteria – could show that bacteria can live on a surface ok but when put inside, infect an organism
- Not sure about use of decaying food use in the useful bacteria section
- Key message not covered by lesson and the lesson is too advanced. They only need to understand that bad bacteria exist and cause undesirable infections
- Need to emphasise spread could set up closed and open containers and see difference – e.g. yoghurt / jam
- As well as apple, need to teach that humans get ill from bad bacteria
- Use of the word streptococcus too complicated. Could describe sore throat

Web Game

- Not keen on ethic to win is to make someone ill?
- Too complicated – do not need to know about white blood cells?

Group 3

Objective: not always. Do you mean new or different infection? “strep throat” – children may not understand this term. Use throat infection called Don't mention protozoa – children never heard of it – nor have I!

Questions: good range – use demonstration at same time (use knitting needle and some kind of dye) Important point to make is that needles can spread disease. Therefore needles must be disregarded after use or sterilised before further use. Teacher to demonstrate this. Good investigations, use knitting needles not sewing needles (from safety point of view).

Group 4

- Good bacteria becomes bad if in a bad place
 - Wound as example
- Most bacteria are good

Activity

- Practicality
 - Can wait 5 days?
- Issue with using needles
- It has to be done in a school but not all primary schools have one
- If it is an issue, could use a fork instead of a needle

- Would be allowed in Czech

Messages:

- NOT in different ways
- What matters is **where** they are.
- Use same equipment (important message)
- France – no needles but likes idea
- Use organic apple (with no antiseptic drugs on skin)

Web Activity

- Make person sick by creating toxins (special power obtained)
- Also good bacteria as well as white blood cells in game
- Skin Mucosa
- Bacteria of different aggressiveness
 - Toxins
 - Multiply quickly
 - Enzyme to enable to bacteria to attack directly one another
- Defence
 - Skin / mucosa
 - Good bacteria
 - White blood cells

Gut game – swimming down gut with good bacteria on walls. Looking for gaps in the walls to attack (this may mean leaving some bacteria to multiply or something). Collecting toxins along the way. Trying to get to the end in a time limit but with stopping along the way to power up as appropriate. Weapons such as enzymes allowing you to attack bacteria / multiplying to overwhelm and toxins fight skin / good bac and white blood cells.

When you reach the end you have to defeat the endermis and a biofilm may be a barrier protecting it from you.

Group 5

- Strep throat not good example. Inaccurate – don't cough with strep throat. Also bad example of respiratory hygiene
- Very confusing description
- Mixed message about viruses and bacteria. Why mention protozoa now, not mentioned in the introduction
- Key messages not conveyed
- Key message here is that disease can spread between people
- Focus on preventative behaviour e.g. hand washing

Activity

- Can't have alcohol in junior school
- Or needles
- Likely to be fungus rather than bacteria rotting the apple
- Concept of sterilization not explained first
- Use cotton but to transfer mould from one jam to another rather than needles and apples

Web Game

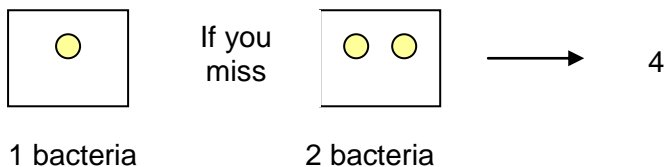
- Too complicated
- Introduces WBC – never mentioned before
- No introduction given to immunology

- Kids get energy and bacteria grow
- Turn game around – sick human make them well by beating the microbes

Group 6

Web activity –

- 'did not look at pass it on'
- Not goal to make person sick
- Shoot them with antibiotics
- Attacked by bad bacteria
- Keep continuity of characters
- Can you really identify the bacteria as yourself? Pupil should be the person trying to fight the bad bacteria
- Use the pupil/child as the protector /helper
- Teaching another character would avoid becoming sick with bad bacteria
- Nintendo – like game to be downloadable
- Different levels
- 1= something that causes sneezing (use WBC/antibiotics)
- 10 = Anthrax or plague
- Become more tired as use WBC
- Use antibiotics – some antibiotic resistance (limited amount)
- If you miss the bacteria with the antibiotic you could die



- Too violent, promote violent behaviour?
- Good bacteria game is friendly game
- Bad bacteria game more aggressive

Group 7

Group 8

Activity

- Good activity
- Simple activity – good!
- Good to visualize infection
- Teacher would have to demonstrate
- **Key Message: prevention is better than cure**

Game Idea

- Snakes and Ladders where snakes are bad bugs and ladders are good bugs

Web Activity

- Mixed message – you should be the good bug
- Make good bacteria grow
 - Eat fruit and vitamins instead of 'diamonds'

Group 9

Activity

- Like disease aspect – not so much the food aspect
- Should include viral infections
- Should keep all the lessons (in the pack) very flexible, don't have lessons dependant on one another, allow mixing and matching of lessons
- Like the lesson that it shows spread – should include more examples

Web Activity

- Like game

Hand Washing

Group 1

- Like the cinnamon activity – very easy to do and harmless(?)
- Not sure about extension activity
- May not work – need to try all fruit not sure about yeast on fruit surface
- Better to use fresh sliced bread
 1. Straight into bag
 2. one hand print without washing
 3. hand print with soap
 4. hand print with antibacterial soap
 5. dampen bread with boiled water

Cress activity

- Jean Louis
 - “boff” oh dear!
- We like the game (sneezy I think) – the school children will like even more – concept v.g.
- Repeated hand prints – glitter goes everywhere!

Group 2

- Message – wash hands properly / correctly / effectively
- Good example – soapy solutions
- Not sure about ‘what’s growing’
- Unsure about ‘cress’ – do other countries have it?
- Also does cress definitely not grow on soapy water?

Group 3

Have you tried this experiment? Do adults know why warm water helps or soap helps? Can they explain? Teachers will need to be told WHY this helps so they can explain to children.

Extension activity – good follows first appropriately. Soapy solutions would be appropriate for 7-8 year olds but not the why part.

What’s growing on your hands?

Cress seeds may not be used in all countries

Question Conclusion 3 – consider vocab used – How can we reduce the amount of living things growing on your hands.

Group 4

Message

- Don’t share your germs
- Keep your germs to yourself => don’t wash your hands?
- Is it EB?

Soap Solutions

- Check for allergies to soap or cinnamon
 - Propose alcoholic rub, not soap and water
 - Alcohol could be problem with kids

- Glow Germ – provide to other countries?
- What's growing
 - Good idea

Group 5

- Oil not practical – it would get on books, clothes etc
- Use glitter gel as alternative
- Otherwise very good activity
- Record how long it takes to remove all the bacteria
- Key message met
- At correct level for age

Apple experiment

- Might not get expected results
- Enzyme browning may occur
- Confusing animal and plant flora
- Experiments that do not work put children off science

*This can be used with hand washing too – add different washing activities –

Group 6

- Must be to early pupils
- Make a rhyme or song
- Like a finger game so pupils learn processes in hand washing
- Add what our hands are used for – picking things up, feed us

Cinnamon activity

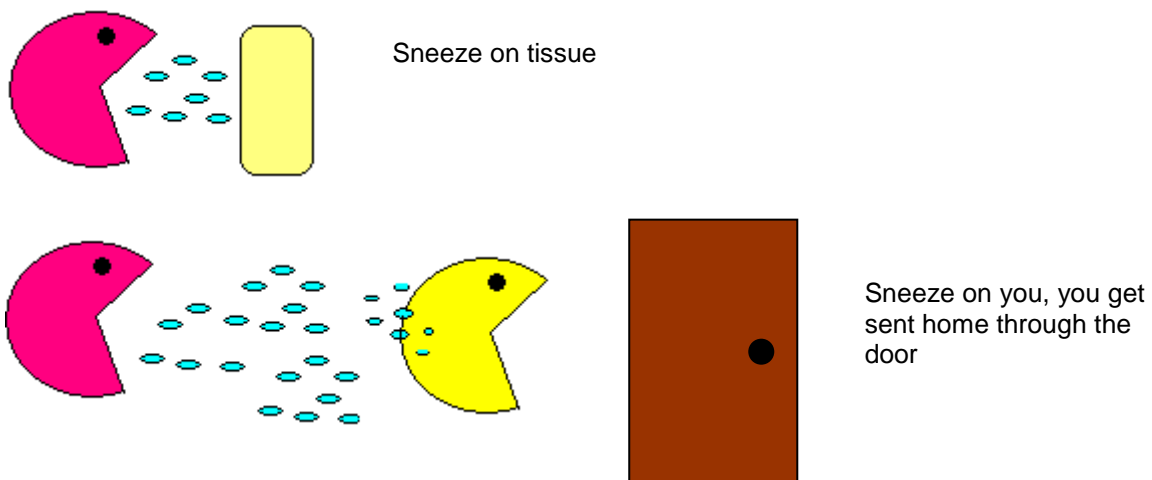
- Requires access to warm water
- Is it better warm or cold – NO
- Just show soap is important

Ideas

- Use a shaking hands / glitter glue
- All have small amount on hands – shake hands
- Come back from washing hands
- Name and shame those that have not washed it all off
- Glitter glue – shake hands along a line and look how far it has travelled

Web Activity

- Hero same, goal – hero must NOT get infected
- Send some of infected home
- You are being sneezed on – run away
- Pak man style except you are escaping from things sneezing on you (sound effects)
- Reward – get to the end of the maze healthy



- Learn about transmission/avoidance
- You can put up tissues as a barrier to infection
- Learn how to spot if your friend can infect you
- Motivation to complete the game?
- 2 games – 1 you are not infected and you avoid those infected by giving them tissues, at end of maze more and more appear
- 2nd – you start coughing(not always) press tab=tissue must get to end of maze without infecting 3 others
- More and more surrounded by healthy people you have to avoid
- Game for a mobile phone – for download (not Nintendo) something easy to access
- *Greece under 16 mobiles not allowed

Group 7

Group 8

Soap Solution activity

- Some classrooms don't have hot water
 - Could modify to have teachers bring hot water in basins
- 1-3 children to demonstrate
- Recommended learning

Extension:

- Change message, "even though your hands look clean, this is what grows"

H2O Cress

- Confusing for children

Group 9

- Should focus on **when, where** etc

Activity

- Like the lesson
 - Should show not **HOT** water, but warm
- Don't like the apple – think results will vary
- Should suggest optional lessons like Agar focused ones
- As a general rule, if it requires any equipment, suggest alternatives and make sure it is optional
- Like the cress lesson but weren't sure what cress was at first

Web Idea

- Have animations showing spread of disease through hand contact (see Denmark new thing)

Respiratory Hygiene

Group 1

- Like it
- Could use spray paint
 - Clamped so can't spray more than paper 1cm / 2cm / 3cm etc
 - Then measure size of circle
- Raffaella suggests we should collect ideas over next two weeks
- Slow motion picture of sneeze

Group 2

Spray Bottle Solution

- Message NOT about sleeves
- Use tissues and dispose of properly
- Instead of spray, fill balloon with hole punch pieces – blow up and POP to see spread
- Not enough to teach about using tissues etc

Web

- Could we try to STOP infection instead?
- Winner quickest to control disease instead of closing school?

Group 3

Nice simple activity. Need explanation. Only proves how far disease spreads. Doesn't say how to stop it. Children could come up with prevention of spread afterwards.

Group 4

Spray Bottle Idea

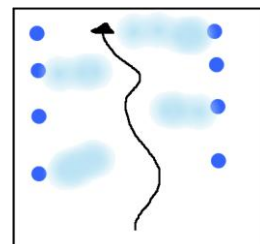
- Good idea, but make sure the bottle's distance is comparable to humans' sneeze
- Show video of people sneezing
- Show sneezing with / without mask

Web Activity

- Would show how quickly can spread
- How many persons would be contaminated if not sneezing in sleeve
- Make game with different hypotheses
 - Vaccination
 - Mask
 - Sneeze in sleeve
 - Etc

Game Idea

- Sneezers in a field
- Each sneezes with different severity
- Have to make it to other side un-infected
- Strategies dependant on current status
 - Mask, slow and easy
 - No mask – RUN!
- If contaminated
 - Wash hands
 - Vaccine



- If infected, slow down, eventually die

Game Idea

- Snakes and ladders
 - Infections make you go down
- Covering mouth etc can provide bonuses

Game Idea

- Avian Flu Game
- Tools:
 - Mask
 - Vaccination
- Spread
 - Walk
 - Trail
 - House
 - Plane
 - ...

Story

- Food poisoning
- Caviar from Tehran -> Paris on plane
- “arrive safely”
 - What if pilot gets infected
- Die if they fly / show pilot died

Group 5

- Easy to do – fun!
- Include prevention. Use a tissue to show spread is reduced but not completely prevented
- Link this activity to hands as transfer factor
- *Touch the wet paper and show that hand prints can be made on another sheet of clean paper
- Does not convey message. Activity demonstrates spread of infection. Our modification demonstrates original aim.
- Could be very messy with all that water. Too many groups! 2 groups: 1 with tissue, 1 without

Group 6

As above

Group 7

Group 8

Spray Activity

- Provide child with sheet, apron, old jumper etc
- Appropriate
- Suggest alterations
- Cover floor

Web Game

- Mixed message – we are trying to prevent disease not spread it
- Learning game would be better
- School could be infected and you're stopping the spread
 - 1 classroom quarantined and you're trying to stop spread

Group 9

- This would be a good time for a quiz – because they know a lot now
- Could use a scenario to reinforce all learning to date (Double Loop Learning)
 - Go over all content again but in a new context

Key Messages

- Slogan: "Block the sneeze"
- Slogan: "Get ready for the action"
- Is coughing not more important – when you are really ill, you cough more than sneeze
- Repeat the need for hand washing after a sneeze
- Message: If you are sneezing or coughing regularly, you should go home!

Activities

- Like the sneeze lesson
- Should show how long bugs survive when sneezed

Web Activity

- Like the game
- Teacher needs to reinforce the prevention message

Antibiotics

Group 1

- Antibiotics don't cure all infections
- You don't need antibiotics for all infections
- Jenner concept difficult for juniors
 - Better as an extension
- Do story of Flemming as an activity
- Need to show in an activity that antibiotics kill good bugs and select out bad ones (can we do this? Video clip?)

Key Messages

- Children grouped in middle
- Read out our statement about prudent use
 - Children more likely to L if agree and R if disagree
 - Need to say why then repeat it to see if people change and use new topics

Group 2

- Do not mix message of antibiotics and vaccines
- The message is about antibiotic use yet the activity is about vaccines
- Should include vaccines in message if in lesson
- Do not need to know about names of scientists
- Could add pictures to a story board about safe antibiotic use
- Could research family history of what antibiotics used and for what. Were they cured?
- Project work with surveys etc to find out about antibiotics
- Could ask about a symptom and find out who has had what treatment and how it worked
- Could read story about person who takes too many antibiotics and get pupils to draw storyboard about what happens

Web Activity

- Could have guns to select – one can be antibiotics, other vaccine, other white blood cells
 - If antibiotic gun used, too many bacteria will remain / will come
 - Could relate to symptoms but that may be complicated

Group 3

Story of Edward Jenner

Mixed messages – children may think that if they take some puss from an infected person and inject a healthy person this is a vaccine. Story needs more info. Maybe spend a little more time on this part (more than 10 mins) How did Jenner get idea to treat smallpox? Problem with content. Good activity though – suitable.

Group 4

- Could show as race (between antibiotics / bacteria)
- Are a **cure** if bacterial infection is present
- Colds / flu is too complex at this age
 - Move to senior pack
- Not vaccines available against all bugs

Activity

- Only this example
 - Use virus against another one
- Story of James (child, not Jenner)
- Poster
 - Parents will have to do it (if given as a homework activity)
- Introduce more about viruses at beginning to help them to understand this
- Penicillin was not the first antibiotic (is this controversial?)
- Use smallpox as an example
- Before penicillin, Cinchona, Arsen, Cheese in Ireland
- France used moulded bread in medieval times, not Fleming first, was Duchene
- The above detail (3 lines) best for senior
- Historical aspect / myths
 - Blood letting
 - Leeches etc
 - But show scientific progress too

Web Activity

- Like resistance aspect
- Show battle is never finished
- For AIDS, vaccine not effective
- In body there is no good bacteria except in bowel
- All ideas together, look at a big game – uses all routes

Group 5

- Historical activity
- Very dull! Visual aids required
- (way activity presented to children)
- Posters good idea, but scientific discovery key element
- Turn Jenner story into a play
- Prepare detailed briefing for teacher with outline of the characters and their role etc
- Key message – met but not enough details
- Lister/Koch nothing to do with antibiotics or vaccines

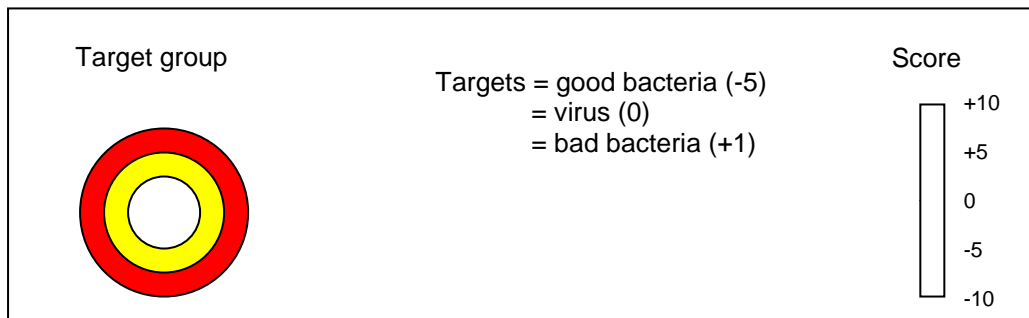
Antibiotics

- Put simple background information into the introduction (section1). Antibiotics kill bad bacteria but at the same time kill our good bacteria. They do not kill viruses
- Therefore antibiotics should not be used unless really necessary when we have a severe bacterial infection
- Create puzzles – bacteria shapes eg squares viruses round
- Antibiotics fit the square shapes on the bacteria

Group 6

- Good story but not 9-11 year olds
- Poster presentations are done by parents of young pupils
- Must be a clear message of usefulness of vaccines and antibiotics
- Jenner – some diseases you have once when you are protected so found out you can give a tiny amount of weak microbe and will be protected = vaccination
- Fleming – discovery of antibiotics
- Antibiotic production too confusing for young people

Web game



Group 7

Group 8

Activity

- Teaches about vaccinations not antibiotics
- Simple story
- C3 too difficult
- Change story to Fleming
- Like stories – children still like stories
- Don't give different scientists, focus on Fleming
- Could split class 50% Jenner, 50% Fleming

Web Activity

- Put message in about finishing course
- Do not introduce vaccinations
- Perhaps 2 stage?
- Needs a lot of development
- Mixed messages
 - Is it about vaccines? Bacteria? Antibiotics?
- Seems overcomplicated.

Group 9

Appendix II – Comments from Junior School Break-Out Groups

Please note this is an exact transcript of notes taken during the meeting

Introduction to Microbes

Group 1

Activity

- Difficult to bring food in
- Too childish to talk about a 'chest'
- Microbe 'culture' zoo works – but again change wording
- Same messages as junior but dig deeper
- Add protozoa and free living bacteria vs dependant virus and relevant RTI examples
- Take samples from themselves – nose / hand prints etc

Web Game

- Can investigate and closely look at size / shape etc

Group 2

- B justifies A activity
- They can't explain why or what happens
- Can just see, not understand the process
- Same process in human body
- Needs explanation before
- No bad bugs – rotting is a natural process
- Good for us
- Back to bad and good believe is wrong
- At the end, explanation needed
- Crosswords – language problem, translation might not work

Web – not just lab

- Other scenery – home, garden, classroom, drag and drop in the same way
- Areas within the human body – recognise bacteria virus and fungi in a timed game for groups or individual play

Group 3

- Key messages follow from primary well (Possibly add that there are photos / film)
- Found everywhere (revision from primary)

Activity

- Covers only one type of microbe.
 - Instead bring in various objects containing different types of microbes (eg food / compost) OR take photos over a period of time and bring in the photos (more hygienic)
 - Teacher could then oversee some kind of classification activity (whole class).
 - Presentation of data found

Web activity

- We like the web activity
 - Covers the key messages

- Teacher's notes should cover questions / lead discussion about size (children could calculate size of each microbe using magnification of picture) / use a picture on computer to show size

Group 4

- There are different microbes
 - Size
 - Shape
- Correct use of antibiotics
- Immune System
- To stop people pestering the doctor about antibiotics
- Awareness of different symptoms
- Any changes
- Recognize symptoms

Survival of Microbes

- Know reservoirs for microbes
- Size and shape not important
- Important to know difference between virus and bacteria
- Change key message to survival and reservoirs

Group 5

Key messages

- OK but also found everywhere and live in different ways. AS different as frog and lion

Activity

- Learning outcome should be stated
- Too vague
- Too long
- Decorating box for younger children
- Go to market and make a list of items in which children are involved
- Describe role of microbes in each product e.g. transformation by fermentation, preservation, etc
- Q1 b- pointless, when will children be taught the basic information to answer this question
- B- dangerous! Risk from fungal spores or bacterial aerosols. Boxes may become anaerobic OR explode! Smell!?!?
- Use web based simulation instead to show food spoilage
- Decay of autumn leaves a practical alternative
- Product can be used to help plants grow
- Make a list of products that can be composted due to microbial action

Group 6

- Size relative sizes
- Why are there different sizes
- Key messages OK
- 13 – 15 binge drinkers – will not bring stuff into school (too primary in approach)
- Replace poor microscopes by virtual microscopy on the web
- Ask them to bring something they think is clean and something they think is dirty (could be messy)
- Microbe zoo – fingerprints, objects, tongue, hair onto agar plates or some substitute if agar is not available

Web game

- Good as it will allow them to see microbes that won't be able to see under the microscope in school
- The virtual microscope should provide two choices – a light microscope and an electron microscope
- When they use the light microscope they will not be able to see the viruses
- The choice of item to look at should be vast and should be in boxes labelled with the name of the disease/virus e.g. polio, HIV, flu, MRSA
- Also have areas on the doctor or lab assistant skin that you can drag under the microscope, part of cheese sandwich
- Another idea is to have a body they can look using the microscope heart, bladder, blood sterile, bowel and stomach, mouth, skin = lots of bacteria

Group 7

Activity

- What about conditions for life for each type?
- Good idea to research but task vague and getting them to bring in things limited –
- Could allow pupils to grow samples taken from around school on agar to see different types
- Experiment growing a microbe such as yeast and see what happens
 - EG change in PH
 - Or rise in capillary tube clue to respiration

Web

- Viruses cannot be seen under a light microscope
- Zoom could remove prob or viruses not there – pupils asked why viruses not present??????

Group 8

Activity

- Teacher could provide items as well as students
 - Strategic items (yoghurt, cheese, beer)
- Lesson doesn't cover size

Web Activity

- Like the game
 - Simple and appropriate
- Click on link to see the real microbe
- Short, to the point message
- Choose disgusting things to look at
- Show good microbes

Other

- Add key message:
 - They are found elsewhere
- Add extension to look at cheek swabs in class

Group 9

- OK
- Include parasites

Activity

- Perhaps only suitable for the younger kids – 13yrs

- Hygiene rules means not allowed in the classroom in Czech Republic
 - But would be OK in the garden
- How can they identify microbe?
Could extend Microbe Zoo with a microscope exercise
- How could they know the answers for the crossword? Where did they get this info?
- But we do like crosswords!
- They should know theory before experiment (Stjin)

Web Activity

- Like the idea – like a REAL experiment with microscope even better

Good Microbes

Group 1

Activity

- Potato activity better for intro to microbes lesson
 - Microbe culture better here
- ? Does starch obstruct view of microbes?
- Check health and safety – probably ok since working at room temperature
- Food science yoghurt
- Useful bacteria – grow good bacteria
 - Video clips for lessons of valuable types (products, sewage works)

Web activity

- Quiz boring!

Group 2

Key messages

- Most bacteria are good for us – positive wording
- Good microbes can fight bad microbes - NOT
- Reword: colonisation explain – we need bacteria to live in our bodies
- we need bacteria for our own Health
- WE NEED BACTERIAL COLONISATION TO LIVE HEALTHY LIFE

Activity

- Too violent
- Can explain without dead animals on a beach
- Not realistic – no dead animals on a beach with the exception of jellyfish
- Better leaves rot and create compost or fruit – more human than looking at dead animals

Web

- Good quiz

Group 3

- Different Key Messages
 - Not all bacteria cause trouble / problems
 - Useful microbes can be used to fight / attack / protect one's self against harmful microbes
 - We need microbes to survive

Activity

- Suggested activity doesn't cover any of the key messages as results will show protozoa (a microbe not previously mentioned)
- Instead children can grow useful bacteria on yoghurt by putting yoghurt into water and add 'methylene blue'. Children can see results straight away. Need to consider use of 600x microscope (covers all three key messages).

Web Activity

- Web activity is good but it is a consolidation activity as it doesn't teach the children anything new but it does find out how much they've remembered so far. We suggest this activity could be differentiated into three abilities (three sets of questions)

Group 4

- Composting not necessary
- Should food hygiene and spread of disease be brought in here?
- Introduce disinfectant overuse
- Understand of how good bacteria can work for us
- Need good microbes to survive

Group 5

- See previous page
- Learning outcome should be first

Activity

- Impractical
- Microscopy will not work – no staining and magnification too low
- Use video camera to show stained preparations
- Or a special video / web simulation
- Show wider variety of things decaying e.g. skin teeth nail hair scraping etc
- Avoid team names. Also suggested microbes are all pathogens and activity is about decomposition – mixed message
- Shows how microbes can break down dead but not living tissue

Group 6

- Not market oriented, something other than food science
- 'Normal flora'
- The virtual body to look at under the microscope(see previous) could be used to support this
- Blockbuster game – don't limit questions to good bacteria

Group 7

- Key Messages:
 - Use primary messages but add one to cover antibiotics
 - 'Some microbes produce substances that kill other microbes'
- Could stain the sample – make it easier to distinguish different forms
- V. Dependant on what microscopes the schools have
- Could make cider with yeast, sugar and apple juice
- Grow fungi on bread / agar and grow bacteria (not resistant to penicillin) nearby

Web

- Good – but only part of the lesson

Group 8

Activity

- Not related to key messages
- Better choice would be yoghurt, food science
- Like idea of using microscope
 - Dilution expected on yoghurt
- Could make their own yoghurt / sour cream etc
- Swab samples if possible
- "Infect Milk"
 - Promote probiotic use when using antibiotics
- Key Message
 - Protect good microbes

Web Activity

- More important to ask question son good microbes
- Would be a good game for end
- Present list of questions to teacher
 - Weakest link would be better as a game style

Group 9

Key Messages

- “Most are good” instead of “not all are bad”
- Antibiotics seems out of place here – perhaps include it only in here as a not rather than the focus
- Human Body?
 - Digestion?

Activity

- Think too close to the ‘intro to’ content
- Suggest make yoghurt, cheese or bread

Key Message

- Like the quiz, but would children play at home
- Stjin likes this being class rather than web based would be useful.

Spread of Infection

Group 1

Key Messages:

- Infections caused by...

Activity

- Could we use alcohol spray?
- Better to use ordinary soap as antibacterial soap will not get of all bacteria and may give the wrong message
- In certain situations, good bacteria can cause infections
- Need to give different options o bacteria / yeasts
- UV Light expensive
- Glitter gel would probably work better anyway as children move around the room.
- Could give the gel to ¼ class then get them to shake hands with others
- Could do investigations of some real outbreaks
 - In class each writes a different mode of spread / cause
 - Could identify what went wrong ' hospital outbreak ' / 'vomiting at school'
 - Identify how spread could be prevented
 - Food poisoning
 - Chicken pox
 - IV drugs
 - STI's
- Disease can spread via hands, coughing, sneezing, saliva, sexual, blood

Group 2

- Bad title
- Disease doesn't spread – bacteria does. Transmission of some diseases is caused by spread of bacteria or viruses
- 'bugs can spread through air, water and touch. Or various modes.

Activity

- Good, was done in pt but too childish
- (will stop shaking hands for a while)
- Replace shaking with kissing
- Gel – cost, UV light if available
- 6 steps – no-one does it
- Too much for 14 year old
- Focus this age with hand washing, this age explain why – must be seen as their decision

Group 3

Key Messages

- There are three main types of infections (microbial diseases). Viral, bacterial and fungal.
- Most infectious (microbial) diseases can be spread through air and touch.

Activity

- Suggested activity covers part of 2nd key message.
- Teacher would have to reinforce fact that the yeast is acting as a fungal infections (give examples – dogs, cats, children)

Web Activity

- Include all three types of microbial disease / three outbreaks.
- Eliminate three people and find culprit of 1st disease. Return to other two disease and look at the people left over. Find out who has spread 2nd disease.
- Do again for third.

Group 4

- Globalisation of disease
- Tourists and disease
- Age important
 - Young people get more meningitis
- Different diseases, different symptoms, different treatment
- Points 3 and 4 need to be taken together (think this means spread and prevention)
- Point out that there are many ways that disease can be spread

Group 5

- TSA not a common medium in schools
- Malt extract agar would be a better alternative
- Need to use aseptic technique to handle sweets initially or they will become contaminated
- Define yeast to be used and to be used and concentration of solution
- Must be harmless strain eg bakers yeast (also beneficial)
- Activity OK but health and safety need to be taken into consideration eg, temperature of incubation 30oC . Count the colonies observed or you cannot create a chart
- No question on decrease of transmission observed

- Learning outcomes – Microbes can be transmitted between people
 - Microbes can be spread on hands
 - Hand washing is important to avoid the spread of harmful bacteria
 - Contamination decreases

Extension

- Too much time if have done first activity
- Useful for students to be shown 6 steps of hand washing but they will not use it
- Glo gel expensive – UV lamp with correct wavelength unlikely to be available in schools
- NB difficult to promote hand washing in schools due to lack of facilities

Group 6

- Need lots of agar plates which are not available to all schools
- Maybe there is a product pupils can put on their hands then use product B to wash hands and this reveals product A?
- If not use glitter gel
- Cannot use Glo gel (availability) also would need UV eye protection for pupils
- Hand washing steps OK for this age group
- Wash hands blindfolded using coloured product – used for teaching nurses how to wash hands (Croatia and EU wide?)

Spread of Disease

Web content

- Could generate too much of a hostile atmosphere/viewpoint about microbes and encourage them to use antibiotics

- Make it just avoiding catching common cold transmission via hands
- Like Pac Man game but use the SIM CITY format with a person travelling around a city and have options to visit toilets to wash hands etc
- Have pupil travelling to school on a bus avoiding the irresponsible person that is sneezing and infecting surfaces with red dots (be negative about spitting)
- Show washing hands before eating (+) points
- Use tissue when sneezing/coughing (+) points
- Sneezing into hand (-) points
- Spitting on pavement (-) points
- Can it be a game that they can play against one another?
- Pupils could choose to infect everywhere by sneezing everywhere but get huge amounts of negative points

Group 7

- Other ways diseases can spread should be included: ie food, water, sexual contact and skin damage (e.g. tattoos)
- First key message a little ambiguous could relate to types of microbe
- Add word 'infectious' to key message as some diseases are not!
- Could make clear that some infections are person specific and will not spread
- Activity good, realistic
- Good second activity to bring in hand washing – although same as lesson 4 and couldn't do twice
- Good web!

Group 8

Activity

- Give alternatives instead of medic and yeast
- Change to "what is an infectious disease?"
- Extension Activity required
 - Devise a pairs game (name disease + picture of symptoms)
 - For start of topic
- NB – Teach methods of acquiring infection
 - Include STDs
 - Cross curricular

Web Activity

- Not too complicated, so OK
- Needs more work
- Progressive game
 - Start simple, just flu
 - Later have tummy bugs and flu etc

Group 9

- In Belgium, there would not be enough time to do these lessons (would do all of them in one hour apparently)

Activity

- Stjin doesn't think practical would be used in Belgium (no real reason why though)
- In Czech – where to get Agar plates?
- Nobody would do the 6 steps
- You can NEVER wash your hands perfectly, and even if you do, they get dirty straight away anyway

- Good idea
- Is the glow gel not expensive?
 - Should show alternatives
- Could sections 3 and 4 be taught together?

Web Activity

- Like game
- Don't think we need a game for every section

Prevention of Infection

Group 1

none

Group 2

- Ideal task, too complicated teachers will not use it
- This is not practical
- Time consuming
- Pack too demanding time wise
- Science curriculum busy – not just e-Bug

Pack in general

- No hand washing – already know this or they will ignore you

Web

- Hand good – illustrative to see activity – gel – cost issue - 6 steps probably not going to be taught
- 1 activity can cover more than 1 objective – better use of teachers time

Group 3

Key Message

- As Junior pack – need to re-think ‘sneeze on your sleeve’ – Sneeze on a tissue and discard? – “Wash, Wash, Wash your hands song”?

Web Activity

- Covers key messages
- How about making the game multiplayer with option of single player (single player could choose spreader or preventer) – players try to spread or prevent the illness

Activity

- Covers all key messages
- Well planned – we think children would get a lot from these

Group 4

- Strengthen the natural defences by good diet, sleep etc, not smoking
- Hand washing and mode of spread
- Assess the day to day situation
- To wash hands more important if there is illness about
- Clean hands help prevent disease
- Wash your hands at the appropriate times
 - Before food
 - After toilet
 - After sneezing

Group 5

- No introduction
- No learning outcome

Activity

- Old fashioned approach, very complicated
- No instruction to make streak plate from culture
- Dangerous to expose students to aerosols of bacteria

- may be immunocompromised students there
- Should always be aseptic technique in experiment for this age group
- Give a logistical problem to solve instead e.g. how an outbreak of Legionella occurred
- an infection transmitted by aerosols
- Relate to spread of influenza eg on public transport
- Ask questions leading to students realising that they can spread microbes by sneezing
- Web-based simulation game
- Plague – read a text about epidemics and work out how it was stopped
- Ideal for group work

Group 6

- Cannot put B subtilis in a spray bottle – too dangerous
- Use the junior pack activity with paint in a spray bottle
- No technical support in Croatia and it requires too much preparation

Web – Prevention of Disease

- Nice idea and could the bacteria come out of a sneeze and be stopped from landing on a hand by a tissue

Group 7

- Not correct exp. Too complicated
- Are we allowed to spray bacteria?
 - Not good or recommended
- They will be in the air and on desks / floor
- Could do before and after agar plates for hand washing
- Try different soap – ie antibacterial vs normal
- Important key message about body being first line of defence
- Use washing hands / sneezing phrases from primary school
 - Add a bit on body's defence also

Group 8

Respiratory Hygiene

- Sneeze on your sleeve
- Don't sneeze on your hand – inappropriate. Much more important to state to cover mouth with something.
- Coughs and Sneezes Spread Diseases is not enough. Needs to be backed with more info.
- If you sneeze on your hand, wash it soon after.

Activity

- Medic not used in classroom
- Use coloured water instead of agar plates (give alternatives)
- Activity too long
- Important to show live bacteria

Hand Hygiene

- Key Messages:
 - How

- When
- Why

Activity

- Expensive activity – provide alternatives
- Provide info for teachers on where to source unusual things

Web Activity

- Make an attractive animation
- Draw to scale – need to see hand
- Include hand contact
- Change levels by changing population

Group 9

Activity

- Complicated
- Focuses on relatively unimportant facts like an accurate distance measurement instead of just the key messages
- Should focus on messages – like ‘Tissue’ etc
- Need ‘rules’ for washing to be reinforced here
- Czech wouldn’t allow children touch the cultures only the teacher
 - s/he could model the experiment though
- Refrigerators are a problem
- Really need a simple message like “Wash with soap” rather than the 6 steps
- Teaching how to wash hands may be condescending to older kids
- Mention washing hand after cough
- Not every lesson needs to be practical

Web Activity

- Game is good but no need for white blood cells because we can’t change the behaviour there – should only focus on things in which we can change behaviour

Antibiotics

Group 1

Activity

- Better to use cold and flu as example of overuse
- Simplify to one antibiotic
- Basic idea is good
- Would need larger size graph for teacher to explain

Web Activity

- Better to have parent or friend saying it

Messages

- Incorrect to say antibiotic not medicine
- Most common illnesses get better on own because they are caused by a virus

Could use computer game scenarios in class and hold up series of different

Group 2

- Antibiotics are special medicines designed to cure bacterial disease
- Content – difference between antibiotics and medicine (NOT CLEAR)
- Antibiotic resistance rising because over prescribed and kills good bacteria = prudent use
- prudent antibiotic prescription not use
- associate prudent and prescription
- change attitude – future patients should put pressure not to prescribe

Activity

- Not appropriate
- Too complex/confusing

Web

- No vaccine – prevention only
- Just bed rest x antibiotics only

Group 3

Key Messages

- What does 2nd key message mean? What point are you trying to get across?

Activity

- Good
- Also brings in interpreting data
- Teacher needs to make it clear that Sally needs to take the antibiotics every time
- What is 'feeling better'
- Clarify term 'disposes'

Web Activity

- Antibiotics and Vaccines
- Make it multiplayer or if not, add a timer to the game (hours / days – more realistic)
- So kids could try to beat each other's times.

Group 4

- How they were found
 - Fleming
- Vaccines should move here
- The success of vaccines in wiping out smallpox, polio
- Jenner
- Ethical issues

Key Message

- Prevention
- Taking all of the treatments
 - Antibiotics
 - Malaria tablets
- Misuse and incorrect use of antibiotics
- Resistance – to unfold this word
- What does it REALLY mean?
- Important for the future
 - Needs a computer game

Group 5

- Clinically inaccurate – monthly tonsillitis probably due to acid reflux not bacteria
- Text does not make sense
- Data far too complicated for age group
- Explanation of resistance mechanism necessary

Alternative

- Stats provided for antibiotic prescription in European countries and of levels of resistance in those countries. Get students to correlate results and explain them. Ask questions about prevention

Video or PowerPoint presentation

- How resistance is transferred between bacteria
- Antibiotics only work on susceptible bacteria
- Different rates of prescription and resistance
- What people do that is wrong
- Ask students correlate all this information and explain why the situation has arisen
- Bring in factors such as over prescription etc
- Tools to avoid over prescription, vaccines, education about viruses, many infections do not need drugs

Group 6

- Is it the bacteria not the teen that has become resistant?
- Not tonsillitis – just a sore throat – sneezing coughing
- To ensure it shows she is receiving antibiotics appropriately
- Graph provided use difficult units – use millions of cells
- Q2 on student sheet – instead ask what causes resistance in Sally's cells
- Too complicated, leave out graphs
- Graphs don't reflect the samples taken
- She already had resistant bacteria from the sore throat treatment
- The intern doctor would not be doing this type of investigation

- Like the idea, it shows that inappropriate antibiotics affect her flora and her accident reveals her resistant bacteria. She would not know otherwise
- Add that a bacteriology sample should be analysed to find the causative agent of the infection and which antibiotics would work
- So adding in the days of the week overcomplicates the resistant bacteria originate from treatment of sore throat weeks before. (no need to expand on hetero-resistance)
- You've been infected – do this in groups of 10 not whole class – nice activity
- What centres for disease are there? This will require web access
- They could look up facts based on the places they would like to visit
- Like the introduction of epidemiology – they could be provided with resources
- Teacher could hand out cards with pictures of countries the pupil will be travelling to along with cards to help them prepare for their journey in terms of which diseases are prevalent and which vaccinations they should have
- Pupils present to each other – examples should include those that do not have vaccines e.g. Dengue fever and malaria

Web

- Keep the symptoms simple
- Like the idea the nurse helps them decide as they are focussing on the treatment and consequences of the wrong treatment
- So this is out patients, don't include such things as endocarditis – lets just relate it to the common cold

Group 7

- Don't like "Antibiotics are not medicines"
 - What is point of this?
- Key messages
 - First one good – but add examples of infections eg colds and flu
- Prudent Use – needs to be explained
- Finish course
- Do not use leftover antibiotics
- Or other people's
- Could use primary key messages also
- Activity too difficult and it is unnecessary to interpret graphs such as these.
- Need different activity and teacher information for non-specialists

Group 8

- Sometimes, antibiotics are the only medicine left – we need to use them appropriately
- Bacteria can become resistant through inappropriate use

Activity

- Difficult task for teacher to co-ordinate
- Too high level
- Make the story into a game
- Too complicated

- 1st three graphs are good, the 2nd are too difficult
- Split the class into 4, give each an antibiotic with a date
 - They draw on graph
 - They decide which antibiotic to use
- Key message:
 - Not all antibiotics work on all bacteria
 - Some bacteria become resistant to **all** antibiotics
 - Some are naturally resistant
 - Get medical advice before taking an antibiotic treatment

Web Activity

- Vaccine is a prevention, not cure
- Like idea overall
- Longer scenario – have a continual game, not a lot of short games
 - Make it more complicated
- Vaccine could be incorporated in the nurses section.
 - If presented with illness, it's too late to vaccinate, but if a healthy person comes in worrying about the flu...

Group 9

Key Messages

- Antibiotics are a type of medicine
- Should say how to deal with flu
- Most illnesses get better on their own
- Mention Viral vs bacterial
- Should let doctor choose antibiotic need
- Theory about how antibiotics work
 - Important to explain the mechanism
- How to use antibiotics
- Finish course
- Show that antibiotics don't make you **feel** better

Vaccines

Group 1

Activity

- Killer is good
- Vaccines are important to prevent a range of viral and bacterial infections
- Activity is interesting but children have one hour of science a week . So may be too difficult to fit in.
- Danger for allergic children?
- Perhaps problem of space if you can't move tables
- Extend
 - How to wash hands and why

Web Activity

- Could take in vaccination and be different microbes (virus or bacteria) to see different effect of antibiotic

Group 2

- Message wrong
- Vaccines are used to prevent infectious disease by simulating our immune system

Group 3

Key Messages

- Some People can be carriers of infection without getting sick or showing symptoms
- Most (viral) infections are prevented by vaccinations
- Why are we focusing on viral infections? Is this covered by curriculum?

Activity

- 'Zap' – we're not sure what it's teaching children, but it's a nice game!
 - Round 2 is better
- You may need to consider the use of this game for this age range of children – they may find it too young for them. How about using water pistols?
- The game needs to be more complicated to be realistic
- Round 1: at least:
 - 1 virus carrier, 2 players (can be infected and can infect others), 2 players (cannot get infected – carriers only)
- Round 2: 1 x virus carrier and at least:
 - 2 x player (can get infected and can infect others)
 - 2 x players (cannot get infected – carriers only)
 - 2 x players (cannot get infected – been vaccinated)
- Children must identify original virus carrier
- You can have several goes at round 2 increasing the amount of vaccinated people which would show the vaccination barrier)

Group 4

None

Group 5

- No learning outcome
- No introduction
- We don't like this activity. Better for younger children
- Questions are good. Needs more interesting and informative activity.
- Need to explain differences between antibiotics and vaccines

- Prevention vs cure
- Case study approach eg in UK MMR story and resurgence of measles
- Hep B in China (preventing chronic infection and effects such as cirrhosis carcinoma, years later)

Activity

- Card game to be devised based on 'Pouilleux' (Old Maid)

Web

- Making diagnosis difficult, unless very good background information provided
- Infection would have to be very carefully selected to avoid ambiguity

Group 6

none

Group 7

- Key Message: Do Not Like!
- Could use ones from primary
- Activities – fun and interesting
- Could assign pupils with diseases to research
- Web - good idea

Group 8

- Used to *prevent* infection
 - Promotes message that vaccination prevents at an individual and community level

Activity

- Attractive game but could be too long for one class
- Section A could be played by whole class and section B by smaller groups

Activity Suggestion – Section B

- Provide information for students – match country with disease and vaccination
 - Countries may have different vaccines
 - Important to show that not all diseases are covered by vaccines
- Pair games
- Research their own vaccine history
- Each country requires different vaccines – compile a list
- Provide a list that *can* be treated by vaccines

Group 9

- Why not mention this during prevention section?

Key Messages

- Some illnesses have no vaccine
- This should not be a 'heading item'

Activity

- Like part B – think it will appeal
- Idea:
 - Pupils could come up with a recipe for necessary vaccines in a region

Web Activity

- Game may not add much to the teaching