

“HEALTH FOR KIDS”

Multimodal resources for popularising health knowledge on websites for children

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Abstract – The aim of this paper is to shed light on the ways in which verbal as well as visual elements are exploited in the explanation of health concepts on two websites expressly designed for children aged between 4 and 12, whose express aim is to popularise health knowledge. The two websites under investigation are approached taking into account multimodality. This provides instruments suitable for identifying cases where the visual mode interacts with the verbal mode to support popularisation. The analysis shows how the verbal mode exploits the visual mode to render information more accessible to children and contribute to their understanding. Through ‘human-like characters’, the images relate to real-life experience. They enhance the information transmitted and complete it with realistic details.

Keywords: popularising health knowledge for children; educational websites; image-text relations.

1. Introduction

Over the last two decades scholarly research has emphasised the role websites expressly designed for children play in developing children’s literacy learning. Djonov (2008, p. 217), for example, suggests that they are “‘edutainment’ or ‘infotainment’ texts as they aim to *both* educate or inform *and* entertain their overt audience – children”. In these digital tools, information is presented appealingly through multimodal strategies (Kress, van Leeuwen 1996, 2001; Lemke 1998; Unsworth 2005, 2006) to both educate and entertain. The contribution of these multimedia resources with their multimodal features to the educational process was discussed by Buckingham and Scanlon (2004), who approached edutainment websites for children by presenting a method of pedagogic analysis focusing on multimodality, navigation, and interactivity. Other research on the importance of web-based educational hypermedia to knowledge dissemination addressing children was carried out by Zhao (2008), who investigated the ways in which a children’s website re-contextualises history

for youngsters. Similarly, Maier (2008) illustrated how knowledge communication can be multimodally constructed in interactive texts on a website of scientific lessons.

Knowledge dissemination addressing children is a fairly recent area of inquiry in connection with popularisation from a discourse analytical perspective. Research in the field has focused on popularisation strategies adopted in different genres and specialised domains. For example, Sezzi (2017) explored popularisation as a form of remediation in history books for children in translation. Diani (2015, 2018) examined the linguistic-discursive strategies for the successful transfer and effective dissemination of legal concepts in texts destined for children, such as newspaper articles and information books from a cross-cultural perspective (English and Italian). Attention has also been devoted to the ways in which specialised and culture-specific concepts are reconceptualised and recontextualised. Cappelli and Masi (2019) analysed the discourse of travel guidebooks for children in English and Italian. Similarly, Bruti and Manca (2019) investigated the strategies adopted to recontextualise specialised knowledge in English and Italian children's magazines, dealing with the topic of environmental education.

Parallel to strategies of recontextualisation of specialised knowledge adopted in print texts targeted at children, research on this area of study has been carried out in digital texts for children. Diani and Sezzi (2019) investigated verbal popularisation strategies on the two official websites for children of the European Union. Similarly, these two websites were also explored by Silletti (2017), who analysed how verbal and visual elements interact to support popularisation strategies. Sezzi (2019) illustrated how museum websites popularise art for children. As research has shown, the importance of considering children as addressees in knowledge dissemination can be instrumental in understanding the dynamics of popularisation.

The present study contributes to this ongoing research by exploring the ways in which verbal as well as visual elements are exploited in the explanation of health concepts on two websites expressly designed for children aged between 4 and 12, whose express aim is to popularise health knowledge. The context of this study is provided by previous research (Diani, Sezzi 2020), which looked at the verbal-visual interplay on three scientific websites designed for children in English dedicated to a selected astronomic topic, namely 'The Sun'.

The paper begins with a description of the corpus used for the analysis and the methodology adopted (Sections 2 and 3). Section 4 focuses on the image-text relations characterising one single section of the two websites under investigation, the "Diseases/Illness" section. Section 5 discusses the use of the interactive resources as a case of health popularisation. Some concluding remarks are provided in section 6.

2. The corpus

The websites for children under investigation are *BAM! Body and Mind* and *Health for Kids*.

BAM! Body and Mind (www.cdc.gov/bam/index.html, last accessed 28 July 2019) is a U.S. online website developed by the U.S. Centers for Disease Control and Prevention (CDC), an agency of the U.S. Department of Health and Human Services. As it is explicitly declared on the website, it is designed for children aged 9-12 and aimed at providing them with information about all aspects of health, such as diseases, food and nutrition, physical activity, safety, life, and the body. In terms of audience and purpose of the website, the following brief but nonetheless far-reaching statement is to be found on the website’s homepage:

BAM! Body and Mind will tell you everything you need to know about all of the stuff that matters. Whether it’s nutrition, physical activity, stress, safety, or diseases, we’ve got you covered! We designed this specifically for you—kids 9–12 years old—and even have some awesome games and quizzes to test your skills!

The website’s homepage features anchors to the site’s six sections (“Diseases; Food and Nutrition; Physical Activity; Your Safety; Your Life; Your Body”); it also includes a section addressing teachers (“Teacher’s Corner”) and a collection of educational games (“Game Room”), as shown in Figure 1. Access to these sections is offered by a vertical navigation bar occupying the leftmost part of the page. The homepage also features a surfacing anchor to a mobile game, called “Dining Decisions”. This interactive app, designed for 7-12 year olds, allows children to categorise foods into three different groups: “Go”, “Slow” and “Whoa”. As the child advances to higher levels, more food items will need to be categorised in a shorter period of time. The goal of this game is to help children learn to keep a balanced diet and make the healthy choice. The anchor reading “Information for teachers” leads to the main page of the “Teacher’s Corner” section.

Health for Kids (www.healthforkids.co.uk, last accessed 28 July 2019) is a UK online website designed for children in the 4-11 group, with a view to teaching them about staying healthy and looking after their health. The website has been designed and created by Leicestershire Partnership NHS Trust (LPT) and Diva Creative team with the help of pupils from primary schools from Leicestershire.

CDC Centers for Disease Control and Prevention
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SEARCH

CDC A-Z INDEX

BAM! Body and Mind

BAM! Body and Mind

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Information for Teachers

Teachers: Incorporate BAM!
topics into your classroom activities.

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What's New?

Welcome to BAM!

BAM! Body and Mind will tell you everything you need to know about all of the stuff that matters. Whether it's nutrition, physical activity, stress, safety, or diseases, we've got you covered! We designed this specifically for you—kids 9–12 years old—and even have some awesome games and quizzes to test your skills!


Parents and teachers, BAM! has something for you too. Browse the site to see what kids are learning about. Take a look at the Teacher's Corner to see how BAM! topics can be incorporated into classroom activities.

Explore all of our topics and pages and stay tuned for updates.

FEATURE ZONE

(Please click on a tab below to see the current features)

Immune Plateau | Bully Busters | Physical Activity | HD Smart



THE IMMUNE PLATOON

Find out how the Immune Plateau defends your body.

BAM! Dining Decisions App

Download the **Dining Decisions** game to your **iPad**, **iPhone**, or **Android device** and see how healthy you can make your food plate!


Kendra, our food expert, will help you make smart food choices to stay powered up. Dining Decisions places you in control of your food plate. Decide which foods give you more energy and powerful muscles and which ones are better to eat only sometimes.

Download the free app today!

Available on the **App Store** and **Google Play**

Play the interactive online version of the Dining Decisions game (<https://www.cdc.gov/healthykids/games.html>) to show how you can make the best food choices at school, at home, or on the go. You can leave your feedback on the game by rating and reviewing the app.

Check out our "Ask A Scientist" comic series to learn more!



Ask A Scientist: How Does My Body Fight Diseases? (PDF - 3 MB)

Ask A Scientist: How Do People Become Infected with Germs? (PDF - 2 MB)

Visit Our Virtual Healthy School

Make your school a healthier place for students and teachers!

Fig. 1
BAM! Body and Mind homepage.

The website features a diverse range of health topics, as shown on the website's homepage in Figure 2.



Fig. 2
Health for Kids homepage

At the top of the screen are four tabs corresponding to the content sections: “Staying healthy; Illness; Feelings; Getting help”. Access to these sections is also offered by the image of a space station in the centre of the webpage, serving as an anchor to the four content section icons representing the space

station's screens. Clicking on a section's icon takes children to that section's main page. The "Staying healthy" icon is an image of a little girl on a sedan chair with a crown of fruit on her head. The "Illness" icon depicts a little monster; the "Feelings" icon is an image of a little girl on a boat who is given a shell by a boy; the "Getting help" icon is an image of a little girl with a thermometer in her mouth who asks for help from a warrior. The "Shine Time", "Food for Thought" and "Hailey Comet" icons are three games making learning about health more fun.

From a comparison between the two websites, it emerges that in *BAM!* the emphasis is more on the verbal mode. This may be consistent with the target age group the website addresses, i.e. children aged 9-12 who look for websites that feel more grown-up (i.e. websites offering more information texts than those for younger children). This is not the case with *Health for Kids*, where the overall organisation of the website is visual. As shown in Figure 2, the homepage, for example, consists mainly of icons, and it is only when the child clicks on them that the contents are disclosed. The design itself seems to appeal to small children, who are only attracted to images by their characters and colours because they have not yet developed their reading skills. However, as the texts inside the website reveal, it has been devised for older readers, be they adults reading with children or older children, who have already developed the cognitive skills necessary to process their content.

A significant difference also exists in the types of images. *BAM!* contains human-like characters, as exemplified in the image of the logo of the website, which visualises girls and boys in the target age range (Figure 1). It differs from a website for younger children such as *Health for Kids*, which uses cartoon-like characters to appeal to very young children, as they comprise much of their visual world. Although *Health for Kids* is targeting different age groups, it has familiar elements throughout. Interestingly, it uses a scenario (see Figure 2) based on the metaphor of space travel and children are invited to take a trip to the world of health ("Blast off to Planet X and learn more about avoiding illness. Let's Go!"). It uses an image of a planet to structure the website with astronauts, rockets, smiling faces, and cheerful characters so as to attract younger rather than older children. Ultimately, although both websites include texts and some animated characters, there is no sound. Characters speak but only in the form of a text box or of a speech bubble.

3. Methodology

In order to explore the relations between verbal and visual modes on the websites under investigation, the study adopts van Leeuwen's (2005)

multimodal model of image-text relations. Table 1 shows the description of image-text connections, showing those relations and subtypes that van Leeuwen argues are relevant for this combination of modes.

Image-text relations	Types	Subtypes
Elaboration	Specification	The image makes the text more specific The text makes the image more specific
	Explanation	The text paraphrases the image (or vice versa)
Extension	Similarity	The content of the text is similar to that of the image
	Contrast	The content of the text contrasts with that of the image
	Complement	The content of the text adds further information to that of the text, and vice versa

Table 1
van Leeuwen’s (2005, p. 230) overview of relations between visual and verbal elements.

Attention was also given to the types of realisations of the verbal and the visual modes, following Maier *et al.*’s (2007, p. 467) typology, as reported in Table 2.

Modes	Realisations
Verbal	Internal text – labels inside the image
	External text – descriptions and instructions
Visual	Image outside the page
	Image inside the page

Table 2
Maier *et al.*’s (2007, p. 467) typology of realisations of the verbal and the visual modes.

4. The “Diseases/Illness” section of *BAM!* and *Health for Kids*: an overview

The choice of concentrating on one single section of the two websites, the “Diseases/Illness” section, is for practical reasons, since it is not possible to analyse all the verbal and visual modes and their relationships existing in a whole multimodal hypertext in an article of this length.

In *BAM!* access to the “Diseases” section is through a vertical navigation bar occupying the leftmost part of the website’s homepage. It is only when children click on it that three subsections are revealed (“Disease Detective; Immune Platoon; Disease Database”). In the “Disease” section the

concept of disease is introduced through an image of a child who impersonates a doctor-detective (“Dr. Daniel Disease Detective”) and by the question “Wondering what a disease detective is?”, as shown in Figure 3.

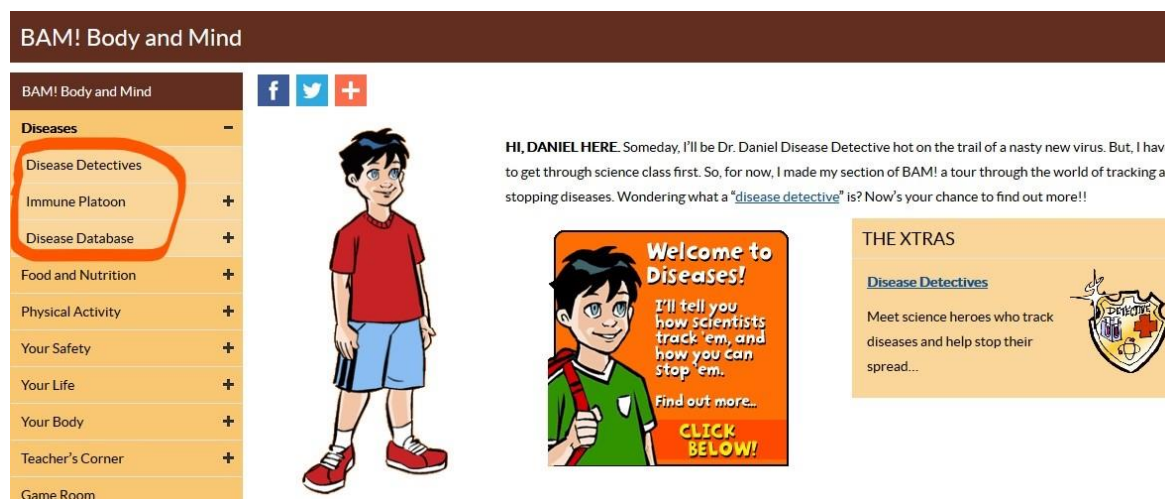


Fig. 3
“Diseases” section from *BAM!*

The fact that it is a child who asks himself the question makes knowledge transmission more immediate. As Stenglin and Djonov (2010) observe, on children’s websites, fictional characters, typically children, speak and think, guiding the child-user in learning.

Clicking on the “Disease Detectives” takes children to discover what a disease detective is. Here an image belonging to a child’s stock of knowledge appears (see Figure 4): a person wearing a brown detective hat and a coat and holding a magnifying glass impersonates the doctor called “Dr. Asthma”. This is an example of how an image supports the popularisation strategy because it has the function of inserting the concept into a realistic context, so that children can perceive the concept of disease as part of their daily lives. The text also realises the concept of detective investigation in picture (through the image of a detective badge), so that it can be visually recognised by young readers.

CDC > BAM! Body and Mind > Diseases

DISEASE DETECTIVES

f t +

Dr. Asthma

This disease detective knows a lot about his case.

Dr. Asthma spends lots of time on the phone and travelling around the country to work with other CDC groups, as well as outside organizations, on the topic of asthma. Dr. Asthma's team closely tracks the asthma cases that occur in the U.S. Their goal is to learn more about what's going on with asthma, so that they can stop the disease in its tracks. Dr. Asthma also oversees national programs to help people get their asthma under control.

Asthma: The basics.
Asthma is a breathing condition that leads to coughing, wheezing (whistling sound while breathing), trouble catching your breath, and a chest that feels tight. Even chest pains, dizziness, and always having to clear your throat can be signs of asthma, and should be checked out by a doctor.

For people with asthma, things like cold or dry air, dust, pollen, pollution, cigarette smoke, or stress can be "triggers," which cause the body to pump out chemicals that make the airways shrink, stopping air from getting through to the lungs—and causing an asthma attack. An asthma attack can feel like trying to suck air in and push it out through a straw!


Physical activity can cause asthma attacks too. Although experts aren't entirely sure why physical activity sometimes brings one on, a likely explanation is that fast breathing through the mouth (like what happens when you get winded) can irritate the airways. Dr. Asthma advises, "When smog levels are high, it's always a good idea to participate in physical activity in the morning instead of in the afternoon — smog levels rise later in the day."

Is asthma a big problem for kids today?
"About five million young people in our country have asthma," says Dr. Asthma. "When your parents were young (about 30 years ago), asthma was an uncommon disease seen in only about 3% of people. Now, it's up to at least 7%, and rising. As young kids, more boys have asthma. But some people 'grow out' of asthma (their lungs get bigger and they no longer have symptoms). As teenagers, slightly more girls have the disease."

How can kids help their friends who have asthma?
If their condition is under control, people with asthma can do the same things that you can. So, your job is to help them know that it's okay to use their inhalers or take their medicines. Also, don't worry about catching asthma 'cuz it isn't contagious.

If your friend or relative is having an asthma attack, it can be scary to watch. But according to Dr. Asthma, the first thing to do is stay calm. Encourage the person to use an inhaler (if it's on hand) and get help.

What causes asthma, anyway?
No one knows for sure yet. Dr. Asthma reports that people's genes help decide whether they develop asthma. Some researchers think that since today's young people are exposed to germs that are different than the ones that kids faced 20 or 30 years ago, their immune systems might not develop in the same way, leading to more asthma and allergies. The fact that more people than ever are overweight also might be related to increased asthma cases. (This does not mean that you should lose weight if you have asthma, though if you're overweight, it could help. Talk to your parents or your doctor to find out.) Perhaps something in the environment causes asthma... One thing is for sure — the disease detectives have leads and they're on the case!



Disease Detectives

Dr. Asthma
Meet Dr. Asthma and learn about his role at the CDC.

Vector Victor
Meet the Vector Victor and learn about epidemiology.

Fig. 4
“Disease Detectives” subsection from *BAM!*

As exemplified in Figure 4, the concept of asthma is presented through a large volume of plain text, as seen in the paragraph titled “Asthma: the basics”, in which a definition, symptoms and causes are presented. Most of the description is provided through the answers to specific questions the doctor formulates (“Is asthma a big problem for kids?; How can kids help their friends who have asthma?”). The text uses technical language and

sentence structure that bring it closer to the style of textbook writing. For example, words such as “breathing condition, coughing, wheezing, chest pains, dizziness” are medical terms popularised for the lay public. On the other hand, the use of sentences starting with “if” functions as a link between a concept and a proposition (“If their condition is under control, people with asthma can do the same things that you can”; “If your friend or relative is having an asthma attack, it can be scary to watch”), but also as a way of showing children how to control their emotions and approach the symptoms of a disease in a practical way. As a result, the text seems to be more informative and less enjoyable for children, where only one picture is present.

However, this is not always the case. Clicking on “The Immune Platoon” brings up a description of the immune system (Figure 5). Here image and text go hand in hand in metaphor creation. The text combines with the image to instantiate a visual metaphor and facilitates the correct interpretation of the image for the children.

The screenshot shows the 'THE IMMUNE PLATOON' subsection from the BAM! website. On the left is a navigation menu with categories like 'Diseases', 'Disease Detectives', 'Immune Platoon', 'Learn How', 'Your Immune System', 'Microbes and Vaccines', 'Disease Database', 'Food and Nutrition', 'Physical Activity', 'Your Safety', 'Your Life', 'Your Body', and 'Teacher's Corner'. The main content area has a breadcrumb trail 'CDC > BAM! Body and Mind > Diseases' and the title 'THE IMMUNE PLATOON'. Below the title are social media icons for Facebook, Twitter, and a plus sign. The text reads: 'Your body's immune system is like having your very own super hero team. At BAM! we call them the Immune Platoon, a team of super-powered white blood cells dedicated to protecting your body from infections and other diseases that threaten your body's good health. [Learn How!](#)' A 'BONUS!' section contains a small image of a green frog and the text: 'Check out the Disease Database to learn about your Immune Platoon's arch-enemies!' with a 'More >' button. To the right is a large illustration of four superhero characters in colorful suits, labeled 'THE IMMUNE PLATOON'.

Fig. 5
“The Immune Platoon” subsection from *BAM!*

As we can see, the immune system, described metaphorically as “The Immune Platoon”, is represented by an image of a team of superpowered white blood cells. Recourse to this metaphor is key to assigning metaphorical meaning to the image. This strategy corroborates the general picture emerging from other studies that the metaphorical element “is cognitively familiar to the reader, being part of his/her background knowledge or everyday experience”. Thus, “when metaphors are used in popularization the kind of knowledge that is usually presupposed on the part of the readers is simply a basic general socio-cultural knowledge ‘of the world’” (Garzone 2014, p. 85).

As research has demonstrated, the use of metaphors serves a pedagogical purpose (Cameron 2003). As we have seen above, it often involves concrete and familiar concepts to help readers understand topics they may find abstract and difficult to grasp. This is particularly evident in the dissemination of knowledge targeted at children, as observed by Vosniadou (1987, p. 882), who suggests that metaphorical thinking plays “an important role in the child’s attempts to acquire new knowledge”.

The verbal description of the immune system is accompanied by illustrations which explain the text (Figure 6). Such visual descriptions imply the establishment of “elaboration through explanation”, as van Leeuwen (2005) calls it, between the verbal mode and the visual one as the images paraphrase the verbal text. The information is thus presented in an entertaining way. The images are reminiscent of superheroes fighting against villains. They are very similar to the X-Men characters, who are specific kinds of superheroes very familiar to children. For example, the monsters as enemies represent antigens attacking the body; the superpowered hero represents the white blood cell that spots the antigens/enemies and eliminates them. Tentatively, we may speculate that visuals contribute to exemplifying the concepts which are being presented to the young reader, but they also encourage knowledge dissemination through an association of ideas. The illustration aims at reproducing the images children have already stored in their memories, so that they can relate them to a similar real-life situation.

Clicking on the subsection “Microbes and Vaccines” takes children to a definition of microbes, bacteria, viruses and vaccines (Figure 7). The concepts to be transmitted are accompanied by illustrations for easier understanding. Microbes, bacteria, and viruses are represented visually as small, ugly creatures with some human-like facial expressions, in the shape of balls with clenched teeth and eyes scrunched downward, creating an idea of something frightening and dangerous for children that can harm them; on the other hand, vaccines are exemplified by an image of a medical syringe used to administer a flu or vaccine shot. Here the verbal and the visual modes enter into a relation of elaboration through specification by which the images make the text more specific.

Unlike the “Diseases” section of *BAM!*, where concepts are transmitted through highly informative texts and only some illustrations having an explicative function are used, the “Illness” section of *Health for Kids* tends to provide more visual support than *BAM!*. It uses a surface of a planet with an underground and an aboveground setting, each one with children playing with other children or creatures. The planet is only shown in the background with what seems to be a sun or a sun-like star (Figure 8).

CDC • BAM! Back and More! • Diseases • Immune Platoon

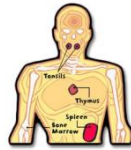
Learn how the THE IMMUNE PLATOON works!



Your body's immune system is like having your very own super hero team. At BAM! we call them the Immune Platoon, a team of super-powered white blood cells dedicated to protecting your body from infections and other diseases that threaten your body's good health.

Your Immune Platoon has a series of secret headquarters located throughout your body, hidden inside tissues and organs like your bone marrow, thymus, tonsils and spleen.

Within these areas your Immune Platoon produces and trains other white blood cells to fight disease; move from one place to another inside your body, or simply wait quietly, ready to swing into action at the first sign of an enemy attack.



Around the clock, they constantly patrol your insides on the lookout for enemies who attack your good health. Known as antigens, these enemies are foreign bodies that enter your body and can make you sick. They could be viruses, bacteria and even pollen. These can cause infections or other diseases such as influenza and chickenpox.

When your Immune Platoon members spot an enemy in your body, their response depends upon their particular "super-power." Different members possess different powers and abilities.



Some of your Immune Platoon absorb their arch-enemy – which prevents the villain from doing further damage to your body – then alert the other heroes which enemy to be on the lookout for.

Others eliminate the antigens or release antibodies that knock out the antigens.

Some of your Immune Platoon heroes destroy the cells in your body that have been taken over by an antigen like a virus, so the virus can't spread and infect other cells.

Others tag antigens with special markers, making it easier for other heroes to track down and destroy them.



Once your Immune Platoon figures out how to defeat the antigens, they will remember what works against them. Should an enemy enter your body again, your Immune Platoon will move to attack the antigen before it has a chance to make you sick.



Sometimes your Immune Platoon can learn how to fight off antigens with the aid of a vaccine. Many vaccines contain antigens that have been weakened or rendered inactive by scientists and doctors.

Others are created from cells that resemble antigens – but who, because of the way they were created, can't cause any real harm. These vaccines are injected into your body to train your Immune Platoon how to fight the real villains.

And since the vaccine antigens possess no "super-powers" that can harm your body's good health, you won't get sick while your Immune Platoon is in training mode!



Once they figure out how to fight vaccines, they remember what works against them. If the active antigen enters the body, your Immune Platoon will move to attack it before it has a chance to make you sick.

Fig. 6
“Learn how the Immune Platoon works”
subsection from *BAM!*

BAM! Body and Mind

BAM! Body and Mind

Diseases -

Disease Detectives

Immune Platoon -

Learn How

Your Immune System

Microbes and Vaccines

Disease Database +

Food and Nutrition +

Physical Activity +

Your Safety +

Your Life +

Your Body +

Teacher's Corner +

Game Room

CDC > BAM! Body and Mind > Diseases > Immune Platoon

MICROBES and VACCINES


[f](#) [t](#) [+](#)

WHAT ARE MICROBES?

A **microbe** is anything too small to be visible to the naked eye. Two types of microbes are bacteria and viruses. You're surrounded by microbes all the time, and normally co-exist peacefully. Some types help you, like the bacteria in your digestive tract that help break down food. There are, however, some types of bacterium and viruses that can make you ill.

Bacteria are single-celled organisms. There are thousands of types of bacteria, and they live virtually anywhere. Bacteria are much bigger than viruses. (But they're all way too small for you to see.) Bacteria are much more complex than viruses. Bacteria have the tools to reproduce themselves, by themselves. They are filled with fluid, and may have threadlike structures to move themselves, like a tail.


Virus. A virus may have a spiny outside layer, called the envelope. Viruses cannot reproduce on their own. They infect cells and take over their reproductive machinery to reproduce.



WHAT ARE VACCINES?


A vaccine essentially helps your immune system crack the code of a certain illness. A vaccine is usually made of the same cells that could make you sick, but they are weak or inactive. Sometimes a vaccine is made of cells that are very close, but not exactly the same, to the cells that would make you sick.

When a vaccine enters the body, the immune system responds the same way it would to any germ. The vaccine is easier to fight than the illness you're being vaccinated against, and it won't make you sick while your immune system fights it. Once the immune system figures out how to fight and defeat the antigens, it remembers what works against them. Should such an enemy enter your body again, your body will move to attack it before it has a chance to implement its plans to make you sick. Sometimes, your immune system needs a refresher course, which is why you get booster doses of some vaccines. Some antigens are especially tricky, and change over time, like flu viruses. That's why people need to get flu shots every year to make sure they're ready to take on the latest version.



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Information for Teachers



BAM! Kids Website

Teachers: Incorporate BAM! topics into your classroom activities.

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Fig. 7
“Microbes and Vaccines” subsection from *BAM!*

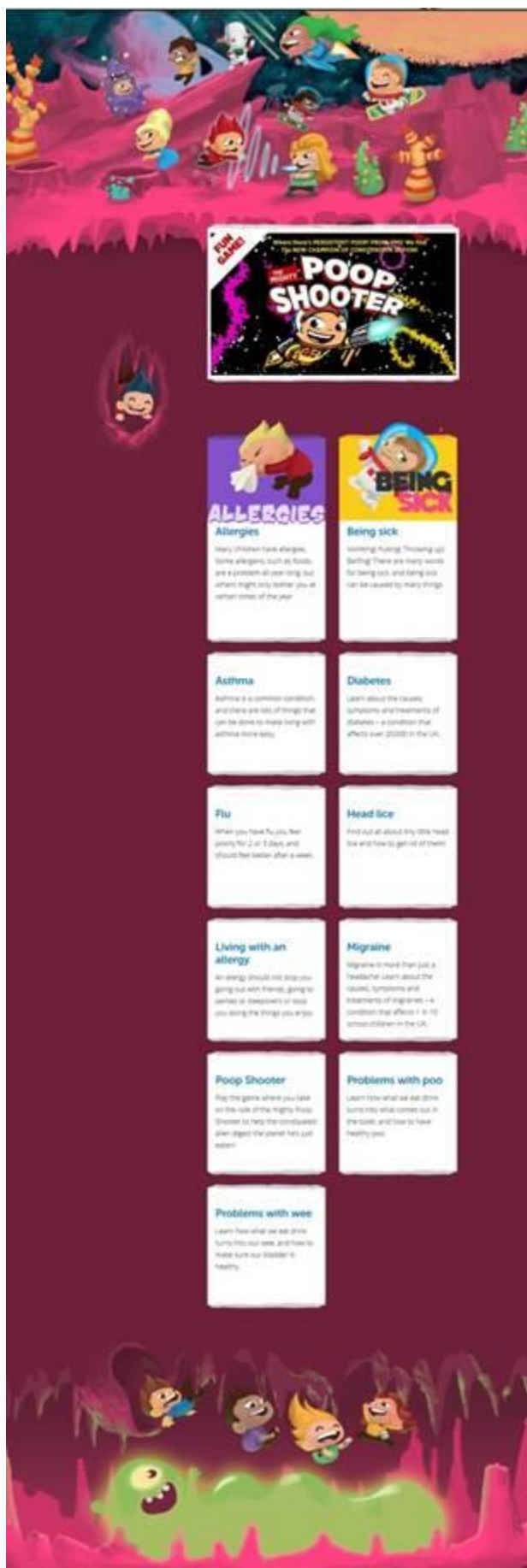


Fig. 8
“Illness” section from *Health for Kids*.

The section consists of icons corresponding to different diseases (“Allergies; Asthma; Flu; Living with an allergy; Poop Shooter; Being sick; Diabetes; Head lice; Migraine; Problems with poo; Problems with wee”). Two icons contain images: more specifically, “Allergy” is introduced through an image of a child sneezing into a white tissue; “Sickness” is visually represented by a child with a sad expression on his face. Each icon provides introductory information on the specific disease. For example, “Allergy” says: “Many children have allergies. Some allergens, such as food, are a problem all year long, but others might only bother you at certain times of the year”).

The next section gives an account of how verbal and visual modes are co-deployed on the “Flu” page of the two websites.

4.1. A case study: Flu

Comparing the two websites, the “Flu” page presents a different layout (Figure 9).

In *Health for Kids*, the text is placed inside an image of a rocket that metaphorically stands for flu viruses travelling very fast and spreading by sneezing. The image covers the whole page. This is different from *BAM!*, where it is the text that covers the whole page and the images only take a small portion of it.

As regards the style of the texts, both have an expository form. The Flu text of *BAM!*, for example, is divided into different sections labelled “Powers and abilities”, “Known weaknesses”, “Preferred victims”, “Precautions for the public”, including a detailed description of signs, symptoms, treatment of flu and of hygiene habits. Interestingly, there is also a section on “Criminal record” including a history of major flu pandemics. Although the text is highly informative, information is presented in an entertaining way. The more child-oriented mode of address of the text is reflected in its use of reference to viruses causing flu as “members of the Flu Crew” (“Influenza viruses, AKA the ‘Flu Crew’, are viruses spread mainly by coughing and sneezing. There are four different types of influenza, or flu, (A, B, C and D) but influenza A and B viruses are members of the ‘Flu Crew’ that cause a lot of illness in people each year. [...] The Flu Crew travels the globe [...] Flu Crew members change all the time”). The verbal metaphor of “Flu Crew” is represented visually by flu virus monsters, so as to boost children’s immediate understanding.

Case file: The Flu Crew

Real name: influenza (Pronounced "in floo EN-zah")
 Microbe type: virus

PROFILE

Influenza viruses, AKA the "Flu Crew," are viruses spread mainly by coughing and sneezing. There are four different types of influenza, or flu, (A, B, C and D) but influenza A and B viruses are members of the "Flu Crew" that cause a lot of illness in people each year. If you are infected, or catch one of these viruses, you could feel pretty bad for a few days to up to two weeks. The Flu Crew travels the globe, appearing in the United States during flu season, which can happen between October and May (fall and winter). Influenza A and B viruses change all the time. That's why, each year, CDC scientists and other flu experts keep a close watch on the Flu Crew and update the viruses that they use to make vaccines. Then, they try to help get as many people as possible vaccinated in order to help protect us from the Flu Crew. The best way to prevent flu is by getting a flu vaccine every year. If you get sick with the flu, there are medicines that can be prescribed by a doctor to treat flu illness.

Powers & Abilities

The Flu Crew's three evil tricks make it tough to combat:

1. Flu Crew members change all the time, and can outsmart past vaccines.
2. Flu is contagious, which means it can spread from person to person.
3. Infected people, those who have caught the virus, are contagious for about a day before they even know they're sick. You are most contagious the first few days of illness.

Signs and symptoms of the flu can include some or all of the following:

- Fever (but some people can have flu without a fever)
- Cough
- Sore throat
- Runny or stuffy nose
- Body aches
- Headache
- Chills
- Tiredness
- Diarrhea and vomiting can sometimes occur with the illness symptoms above, although these are more common in children.

This sounds like a plain old cold, right? **Wrong!** The Flu Crew's attack is sudden, not slow, and can be far more powerful than a cold. The Flu Crew hangs out in your nose, throat and lungs so it usually doesn't affect your stomach.

What's the best way to fight the Flu Crew?

Get vaccinated every year—here's why. There are many different flu viruses that are constantly changing. Each year, scientists keep a close watch on the Flu Crew and try to predict which three or four crew members will cause the most trouble during the next flu season. This way, they can make a vaccine that protects you against those viruses.

Extra actions—besides vaccination—that can keep the Flu Crew from spreading include staying away from people who are sick, covering coughs and sneezes, and washing your hands often.

The biggest reasons to be concerned about the Flu Crew are:

- They can cause serious illness. Most of the time, people who get sick with flu will recover in less than 2 weeks. However, sometimes the Flu Crew leads even normally healthy kids and adults in the hospital.
- Some people are more likely to get very sick from the flu, like young children, pregnant women, older people, and people with certain medical conditions like diabetes, asthma, kidney disease, or heart disease. For a complete list of people who are at high risk of serious flu complications, see https://www.cdc.gov/flu/about/diseases/high_risk.htm
- The Flu Crew is unpredictable and can affect people differently. Even normal healthy people can get very sick from the flu and spread it to others. Since 2010, CDC estimates that between 160,000 and 710,000 people in the United States have ended up in the hospital because of the Flu Crew—that's more than the entire population of the city of Denver, Colorado! Sadly, between 12,000 and 56,000 people die.

KNOWN WEAKNESSES

Flu vaccines are the best protection against the Flu Crew. They train your immune system to recognize and fight the Flu Crew if they enter your body.

For the best protection, health experts recommend that all people age 6 months and older get a flu vaccine each year. That's right, that includes you!

Some kids younger than 9 years old will need to get two doses of the flu vaccine to be fully protected if they have never had the flu vaccine before. Do you have a brother or sister who might need two doses? Make sure to remind your parents to ask the doctor. They'll be impressed by your Flu Crew knowledge!

What if you have the flu?

Keeping this enemy in check requires real alertness. If you think the Flu Crew is making you sick, tell your parent(s) or guardian. Everyone must do what they can to prevent the Flu Crew from spreading their attack. This means staying home when you're sick and avoiding other people as much as possible, covering coughs and sneezes with a tissue, and washing hands well and often!

If you have the flu, your doctor may give you anti-flu medicines called "antivirals" to fight the virus. Getting vaccinated every year is your first and best defense against getting sick in the first place, but if you do get sick with flu, antiviral treatment is a second line of defense to prevent serious flu illness. Antivirals can help you get better faster, but they work best when started early after symptoms begin. Not everyone needs antivirals, but people who have certain medical conditions like asthma or heart disease should get them if they get sick.

PREFERRED VICTIMS

The Flu Crew can attack anybody, anywhere.

PRECAUTIONS FOR THE PUBLIC

- Our main weapon against the Flu Crew is flu vaccines. Don't worry, flu vaccines cannot give you flu.
- Flu season in the United States can start as early as October and last as late as May.
- It's best to get vaccinated each year, by the end of October, if possible. But, the saying "better late than never" is true—even later in the season, the vaccine can help protect you against the Flu Crew.

Remember, in addition to getting a flu vaccine every year, you can help protect yourself and others.

If you are **well**, protect yourself by:

- Avoiding people who are sick.
- Not touching your mouth, nose, or eyes (which is how germs spread).
- Washing hands well and often with soap and water.

If you are **sick**, protect others by:

- Staying home from school, and away from others as much as possible if you've been attacked by the Flu Crew.
- Covering up coughs and sneezes using a tissue instead of your hand.
- Washing hands often and well with soap and water, especially after you cough or sneeze.

CRIMINAL RECORD

The Flu Crew has a well known record of several frightening outbreaks and other tricky behavior.

- A flu pandemic is a worldwide outbreak of disease that occurs when a new flu virus—a new Flu Crew member—emerges and causes illness in people around the world.
- In 2009, a new Flu Crew member appeared called "2009 H1N1 virus" that belonged to the influenza type A family. Since 2009, this new virus member has been included in the yearly Flu Crew vaccine. Just like other Flu Crew members, this virus spreads easily from one person to another and can cause severe illness in people of all ages.
- H2N2 is also part of the influenza type A. It joined the Flu Crew in 1968. It is now part of the yearly Flu Crew vaccine too.
- The worst flu pandemic ever was the 1918 flu pandemic, which killed tens of millions of people around the world. There's a lot more information about this pandemic and even personal stories about people who lived through it on [CDC's web site](https://www.cdc.gov/flu/about/diseases/1918/index.html).
- Flu Crew members also caused pandemics in 1957-58 and 1968-69; these Flu Crew members were not as deadly as the 1918 Flu Crew.
- 2018 is the 100th anniversary of the 1918 pandemic. CDC is preparing a commemoration to mark the historical event. Check out [CDC's Flu site](https://www.cdc.gov/flu/about/diseases/1918/index.html) for more information.

Flu

By getting plenty of rest, it is usually possible to treat flu at home. But if you start having trouble breathing or feel worse, tell your parent or carer as you might have to go to the doctor's.

Having the flu can feel horrible! Flu is different to a cold.

You may have a high temperature, feel tired, achy and shivery and have a headache.

Sometimes you get a sore throat and a blocked or runny nose, and you might sneeze and cough a lot. You also might not feel like eating.

You can catch the flu at any time of the year, but it is more common in the autumn and winter seasons.

You may feel poorly for two or three days, but should feel better after a week.

Flu is short for Influenza. It is a virus that can spread very quickly. When a person who has flu coughs or sneezes, they are releasing millions of very tiny droplets in to the air. These fly everywhere and can spread to an area as big as a hula hoop—and we are not talking about the small round crisps!

Did You Know?

Flu viruses can live for up to two whole days on things like your toys, desk and walls. It can live up to half a day on clothes and tissues. This is why it is very important to wash your hands and to use tissues.

When you catch flu, your body starts producing antibodies—these are like personal ninjas that attack the virus.

When they are working well and defending your body, you start feeling better. The problem is that the viruses that cause flu can change over time. Find out how you can [stop flu in its tracks](#).

What to do when you have flu

Being ill with the flu isn't much fun, but there are some things you can do to help feel better.

- Keep hydrated—Drink plenty of water, juice and soups. Avoid fizzy drinks.
- Get lots of rest and sleep.
- Ask your parent or carer for some medicine to help lower your fever and help with the aches.

Should you go to school?

Flu spreads very easily. If you have flu, it is best that you stay at home and away from school, not only so that you can rest and recover but so you don't give it to your school friends and teachers too.

Riddle me this!

What is 'flu' short for?

1. Ach-Flu
2. Influenza
3. Flooby Dooby Doo
4. Fluicogen Sniffles
5. Oufluenza

Fig. 9
 “Flu” from BAM! (left) and Health for Kids (right).

The Flu text of *Health for Kids* is also organised into sections labelled “Having the flu can feel horrible! Flu is different from cold”, “What to do when you have flu”, “Should you go to school?”, offering an outline of flu symptoms and treatment, but it is very short compared to that of *BAM!*. A possible explanation derives from the fact that the website is targeted at younger readers than those of *BAM!*, and texts should be kept to brief descriptions so that there is no room for the child reader to become bored. This may explain why the website focuses more on the visual mode than on the verbal one, as well exemplified by the Flu page.

As regards popularisation strategies, both websites highlight the tendency to introduce children to the concept of flu through a question-answer mode. As research suggests, recourse to questions is a common strategy of popularisation for children (Diani 2015, 2018; Sezzi 2015, 2017; Silletti 2017). As we can see in Figure 9, both texts are organised into paragraphs, some of which are introduced by *wh*-questions, functioning as titles (“What to do when you have flu”; “What’s the best way to fight the Flu Crew?”; “What if you have the flu?”). The use of questions suggests a didactic function reflecting the purpose the website is designed for, i.e. for children who need to be taught the basic notions of the topic discussed. They shape the structure of the text, following somehow the “traditional classroom discourse structure” (Stenglin, Djonov 2010, p. 205), and arouse children’s interest and curiosity (Webber 1994). We may speculate about this strategy on the basis of the function *wh*-questions express: “an imbalance of knowledge between participants” (Hyland 2002, p. 530), which helps “to construct readers as learners, and learning as a one-way transfer of knowledge” (2002, p. 535) from expert to non-expert.

Interestingly, *Health for Kids* devotes a section titled “Did you know?” in the flu description, as illustrated in Figure 9. This type of question involves children through a game-like structure similar to the fun-fact questions related to trivia and curious facts (Sezzi 2019). This section plays an engaging role but also conveys more specific information about the illness (“Flu viruses can live for up to two whole days on things like your toys, desk and walls. It can live up to half a day on clothes and tissues. This is why it is very important to wash your hands and bin any used tissues”).

Another interesting point to note is that there is a tendency in both texts to address children directly as ‘you’, as exemplified in the following extracts:

- (1) If **you** think the Flu Crew is making **you** sick, tell **your** parent(s) or guardian. Everyone must do what they can to prevent the Flu Crew from spreading their attack. This means staying home when **you**’re sick and avoiding other people as much as possible, covering coughs and sneezes with a tissue, and washing hands well and often! [...] (BAM! Body and Mind)

(2) **You** may have a high temperature, feel tired, achy and shivery and have a headache. Sometimes **you** get a sore throat and a blocked or runny nose, and **you** might sneeze and cough a lot. **You** also may not feel like eating. **You** can catch the flu at any time of the year, but it is more common in the autumn and winter seasons. **You** may feel poorly for two or three days, but should feel better after a week [...] When **you** catch flu, your body starts producing antibodies – these are like personal nijas that attack the virus! (Health for Kids)

The strategy of direct address to the child-reader foregrounds the highly interactive nature of websites for children, whose main purpose is to create a rhetorical effect of “closeness and involvement” as described by Breeze (2015, p. 16), who suggests that “the level of familiarity associated with the second person serves to involve the reader in the story”.

Both sites also create what Kress and van Leeuwen (1996) have described as a “virtual you”, whereby a character appears to be addressing children directly, attempting to establish a direct personal connection (Buckingham, Scanlon 2004). This is exemplified in the “Flu” text in *Health for Kids* (see Figure 9), where a little girl who impersonates the National Health Service, speaking in the form of speech bubble, addresses the young reader as ‘you’. As Buckingham and Scanlon (2004, p. 279) observe, “these visual characters reinforce and complement the message of the written text”.

Children are also addressed directly by animated characters, as exemplified in the quiz “Riddle me this!” at the bottom of the “Flu” page of *Health for Kids* (see Figure 9). In the course of the quiz the expression on the character’s face indicates whether the question has been answered correctly. For example, the girl smiles and moves her head if the child gets the correct answer and the message underneath reads: “Oh yeahhh...you got it right”. However, if the answer is incorrect her expression changes to dejection: her eyes and mouth drop, and her shoulders slump forward; the message underneath reads: “Oh noooo...you got it wrong”.

In terms of text-image relations, both pages appear to highlight how the images are meaningfully interrelated to each other, and they also enter into meaning-making relations both with the internal texts and the external texts that accompany them.

5. Playing to popularise health knowledge

This section investigates how the sites deal with health, focusing on their use of interactive resources which are the predominant formats for activities on websites for children (Buckingham, Scanlon 2004). Both websites use game formats in the context of food/nutrition education as a case of health popularisation.

Health for Kids emphasises the importance of healthy eating for children by making learning about healthy lifestyles fun and inspiring for them. It has put a child’s nutrition knowledge to the test in a trivia quiz called “Food for Thought”. The choice of the title echoes quizzes available online assessing people’s knowledge with regard to nutrition. The quiz is introduced visually through an image of an announcer: a man wearing a bow tie and jacket, holding a microphone and a question sheet (see Figure 10). Most likely, children have seen a quiz announcer on TV and the illustration aims at reproducing an image that belongs to their stock of knowledge, so that they can relate it to a real-life experience.



Fig. 10
Food for Thought Quiz from *Health for Kids*.

The quiz is organised into three nutrition areas: fat, salt, sugar. Children can choose one area consisting of ten questions testing their knowledge of healthy eating. More specifically, each question tests children’s knowledge of fat, salt or sugar content in grams (higher or lower) between two foods, as exemplified in Figure 11.

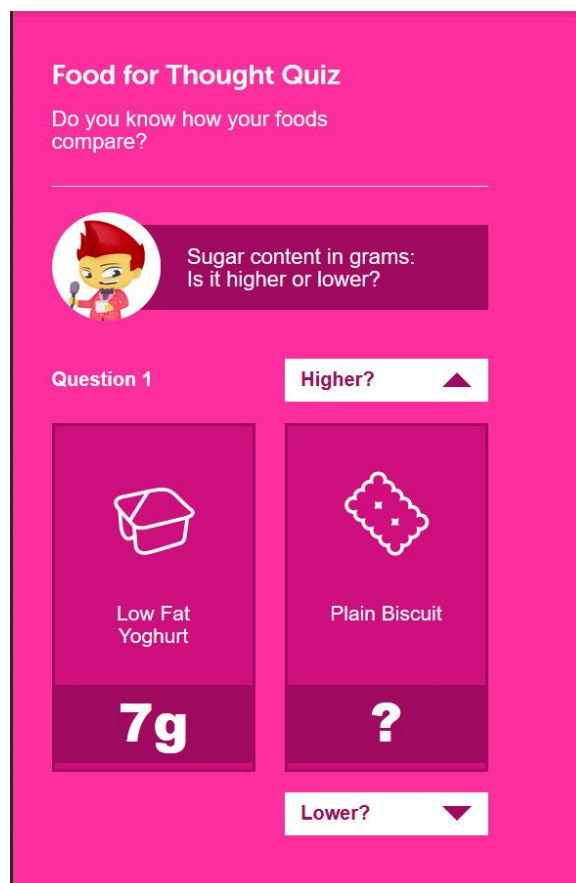


Fig. 11
Food for Thought Question from *Health for Kids*.

In order to move from one question to the next, the child has to answer the question shown on the screen. It is the expression on the announcer's face that indicates whether the question has been answered correctly or not. For example, the announcer winks at the child and lifts his thumb if the child gets the correct answer; the message underneath reads: "Well done you aced it!". But if the answer is incorrect, his expression changes to desolation: his eyes and mouth drop, and he frowns putting his hand on his head; the message underneath reads: "Uh oh! you got it wrong...". Each question has one point associated with it, and as the child answers, s/he adds up points for her/himself. The score range (0-10) gives children their level of knowledge. The score is given on completion of the quiz. As expected, the overall organisation of the quiz is verbal. It is introduced with a good deal of information on healthy eating forming a background for questions. The use of images is only limited to symbolic representations for the selected food, as exemplified in Figure 11.

Differently from the quiz, the game "The Mighty Poop Shooter" in *Health for Kids* develops through images rather than text (Figure 12). This is another interactive resource introducing children to eating healthily.



Fig. 12
The Mighty Poop Shooter game from *Health for Kids*.

The characters are aliens: 'K'ulu the Planet Globber' is the constipated alien whose belly is full of food. The child as learner takes the role of the mighty Poop Shooter to help K'ulu clear the blockages in order to keep him happy and healthy. An introduction to the game uses second-person address ("It's your job to clear the blockages and make sure everything keeps moving as it should") and an imperative statement to convey a sense of urgency ("Let's get started to help keep K'ulu happy and healthy"). The game is developed on an electronic scoreboard (see Figure 13).



Fig. 13
The Mighty Poop Shooter game from *Health for Kids*.

By using a rocket, the child has to click on groups of the same food (visually represented by an icon) to digest them, within a short period of time that is visually marked by an hourglass. The game must be completed before the hourglass runs out. Four types of food can be chosen with different scores. The child can get more points by grouping together as many of the same icons as s/he can. Success depends on the knowledge of healthy food rather than gaming skills.

BAM! also devotes a game to healthy food called “Picnic Pickup Game” (Figure 14). The game consists of clicking on food items a child thinks are the best, so as to make good decisions. Each food is visually represented by an icon. For example, when the child clicks on a healthy food like bananas, a message underneath reads: “Yes!”, and a description of the food is provided: “Fruits and vegetables are a healthy way to get the vitamins, minerals, fiber, and energy your body needs to feel and look good”. On the contrary, if the child’s food choice sounds unhealthy, a message underneath reads: “Healthy eating is like a larger puzzle, where there is a spot for everything. As long as most of your puzzle has whole grains, vegetables, fruits, and low-fat dairy foods, plus some lean meats, fish, poultry, and beans, there is room for a few less-healthy choices”.



CDC

PICNIC PICKUP GAME



Test your smarts in the Picnic Pickup Game! Try to avoid junk foods and click on the healthy, nutritious foods instead to maintain your energy level.

Just click on the best food items to see if you make good decisions.

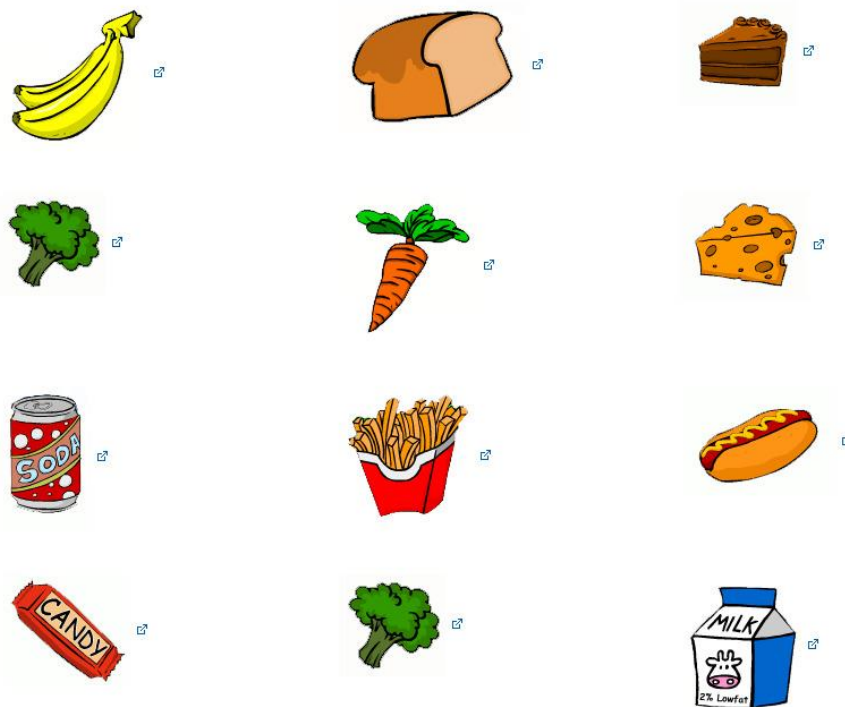


Fig. 14
Picnic Pickup Game from *BAM! Body and Mind*.

The use of these interactive resources makes “the world of health” appealing to children. As Webber (2018, p. 849) suggests, interactive websites as those under examination in this study are “a useful collection of interactive tools for teaching children that health is more than just an absence of illness and

that actively taking care of their health can improve their quality of life now and for their entire lives”.

6. Conclusions

The results emerging from the study provide evidence that on the two children’s websites under examination the use of images supports health popularisation. The visual mode has an explicative as well as an appealing function. As we have seen, the verbal mode exploits the visual mode to render information more accessible to young readers and to contribute to their understanding. Images enhance the information transmitted and complete it with realistic details. However, as the analysis suggests, a significant difference between these websites exists in terms of the appeals they are making to children. *Health for Kids* relies heavily on the visual mode to appeal to very young children with colourful cartoon-like characters, while *BAM!* is based primarily on the verbal mode, as the target age group it addresses (children aged 9-12) is looking to learn for itself. This may find an explanation in the use of long information texts, interspersed with realistic illustrations, e.g. viruses, for instance, are shown with human-like facial expressions.

We could account for these differences on the basis of the websites’ different approaches. As Webber (2018, p. 849) points out, the overall look and feel of *BAM!* “are consistent with the Centers for Disease Control and Prevention Web site, not a children’s gaming site”. On the other hand, the *Health for Kids* approach is geared toward supporting children’s learning about health, using a large number of images that capture their attention. This orientation may have been influenced by the fact that primary school pupils from Leicestershire contributed to the design of the website. As Turner and Handler (1997, p. 33) observe, children, as authors, “develop their own hypermedia compositions. In the process, they learn not only about the topic of their composition but also about the elements of design that are important for communicating effectively in a visual environment”.

Interestingly, the study provides clear evidence that both websites use similar strategies to popularise health knowledge to children. The strategies identified involve:

- features typically associated with science popularisation such as metaphors, both verbal and visual;
- linguistic features typical of dialogic interaction (i.e. *you*);
- the question-answer pattern.

It is commonly assumed that reading plays a fundamental role in the learning of concepts. Even though these websites are not necessarily intended

to be used in schools, they clearly have an educational goal. The way the text is structured encourages both verbal communication (in the form of the children’s personal comments on the concepts explained in the text) and active participation of the young reader (i.e. the use of *you* in the text).

In conclusion, it can be observed that on these two websites the necessity of popularising knowledge is paralleled by the need to involve the addressees, so that the interactive nature of these websites and their games is also found in the popularisation strategies adopted. Children like to play games and compete against the computer (see the quiz). The images related to the games are used in a purely entertaining context. As the websites have shown, each mode of communication serves a different purpose: the image entertains, while verbal language educates (Buckingham, Scanlon 2004).

Since only two websites are used in this study, there are of course limitations to the generalisability of the results. It would be of interest to see how the verbal and visual modes are realised on other websites dedicated to specialised knowledge dissemination targeting at children, so as to collect further supporting evidence of the trends that have emerged from the present study as well as of other tendencies within and beyond those discussed above.

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