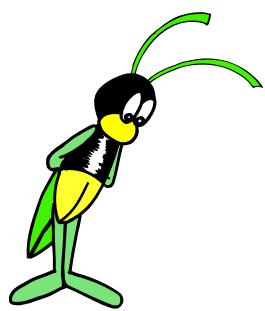


Picture Book for 3-5th grade readers



Title: What really bugs me!

Concept: Starting from a problem (BUG), a group of friends learn how to solve the problem and create a design solution for it.

Learning outcome: Children will understand the vocabulary of creative problem solving and design. They should be able to draw a flow map of the process.

Visual: pictures and the book should look like a student's notebook. Have pictures that look like drawing done by the owner of the notebook. Drawing of what his/her friends look like, some changes that reflect trying something and them changing based on the outcome.

Constraints on the story:

1. Each page has to create some suspense that is answered by the next page
2. Need to develop a **vocabulary** (highlighted words) of key words in the story
3. Need to ask Bloom higher order thinking questions around the story.
4. Picture on the page that shows where this fits into the total picture.
(like a road map)
5. A game the students can play around the theme.
6. Less than 40 pages (text plus picture)= 20 text pages
7. Teacher's templates, examples
8. Poem or other literacy activity

Outline:

A group of kids that get together after school each day at the park, one of them starts an exciting adventure when he talks about what “Bugs him”.

What was the problem that appeared?

How could we as a group help fix the problem.

Page template:



Create a template for developing the story

Page description, picture, key vocabulary, higher order thinking questions, suspense item,

Other Themes

- Keeping my hat on when playing games
- Be able to jump from one rock to another using a rope
- Designing an obstacle course for the playground
- Not being able to build an underground fort
- His juice box gets' warm before he can drink the whole juice box.
- ~~His soda loses the fizz before he finishes it.~~
- Getting my home work done on time
- Something happening to his bike ____?
- He keeps losing his favorite game cartridge.
- He wants to make _____ but does not know how
- Things are disappearing from his school locker.

Page1:

Matthew and Madeline were playing outside after school one day. Matthew said to Madeline, What really bugs me is “My pants slip down when playing our game and I have to stop to fix them”. Madeline giggled but looked confused when he said that.

“Why do you look that way”, Matthew said. Well I don’t understand that word you are using. I never heard Mr. Liu, our teacher, use that word in our class said Madeline. Where did you learn that word and what does it mean?

Page 2:

Matthew had to think for a minute to remember where he heard that word before at home. I know!!! my mother always says that word when talking about problems that bother her. I guess it comes from her work as the engineer at the glass factory. They make all that glass for the new phones and Pads. My mother says that when something does not work right or something she thinks should be different, she calls it a bug. My father says he has to learn some new vocabulary words to talk to my mother, but I guess that happens with any job. Madeline continued to talk about how his pants fall down.

Just about then, their other friends started to arrive at the park. Our friends can help us. Matthew said working as a **team** is always fun and we get many more ideas with a group of us. I wonder why that is so, Madeline says.

Page 3:

When we work together we seem to create more possible **solutions** and it's fun to build on ideas that others have. Many times when I hear an idea from one of our friends, it makes me think of another possible solution. I noticed that we sometimes get hung up on a particular item and we cannot seem to get off of that approach. Mr Liu showed us how we can break up the conversation (get un-stuck) up by using these different hats

How do the hats help keep the conversation going?

Our group:

Name	Little about them
Matthew	Matthew is the oldest member of the group
Emma	Emma likes to play games and is fast on her feet
Cal	Cal likes to ask questions about things
Dahlia	
Elizabeth	
Madeline	
Hannah	Hannah is the youngest member and is Cal's sister



Page 4: (May Remove pages around the 6 Hats, pages4-6)

Our group is all together now and we can discuss what Mr. Liu explained about the flags. Mr. Liu is really a great teacher. He wants us to be successful so he says we have to learn to listen to each other and not just shout out to each other. He explained how a Mr. Ed DeBono came up with this **concept** many years ago to help schools and companies be better at discussion.

EXPLAIN the 6 hats using each character (Friend) to do it.

	White hat thinking identifies the facts, figures and information.
	Yellow hat thinking focuses on the positive aspects – the advantages, benefits and savings.
	Blue hat thinking focuses on reflection, metacognition (thinking about the thinking that is required), and the need to understand the big picture.
	Black hat thinking examines the problems and issues of caution.
	Green hat thinking requires creativeness, imagination and lateral thinking. It focuses on exploration, proposals and suggestions.
	Red hat thinking looks at a topic from the point of view of emotions and feelings, hunches and intuitions.

Using the flags as questions to understand the problem:

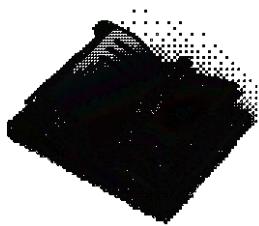
White hat; What do we know and how do we know it?
Yellow Hat: What is good about each idea you come up with?
Blue Hat; How does what we think matter and the big picture that we need to understand?
Black Hat: What are the issues in the idea? What possible problems can arise from each possible solution?
Green Hat; What are some “way-out” ideas?
Red Hat: Using your “gut” or intuition what do you thinking of the idea?

Many time we pick the wrong problem to solve than what we think. The real problem we tend to have is that we need to understand what the real problem is. We need to understand what problem the person is really having before we rush to solve the issue.

Page 5: Finding the true cause of the Bug Matthew said, Many times we go of and try to find a fix (solution) to what we think the problem(Bug) is but it is not the right answer. Let me give you an example of what happened with me last year. I told my father that I was lonely, being a great dad, he went off and tried to solve the problem by organizing a few play dates for me. Although they were fun, I still felt the same. My mother asked me some **questions** and it comes out that my being lonely was really I wanted to find some friends that had the same interests as me to play with. But how do we do this; said Hannah?

Page 6:.. Everyone looked at each other when Dahlia said, maybe we can use the flags as questions to ask Matthew about his Bug to see if there is something else that is the real problem. That is a great idea said Emma. I want to go First!!! She thought for a minute ... So Matthew, you said your pants slip down and you have to stop playing the game until you pull them up?. Is that the problem? (**Blue flag** ... **Clarifying** the problem) Yes and sometimes I pull the belt tighter, said Matthew. Cal then looked at what we know of the problem like it's when Matthew wears pants either with a belt or without. It happens when he is running while playing a tag game. (**White**

Flag ...presenting the facts of the case) It doesn't happen when he plays base ball only lots of running games said Hannah. So we have to figure out how to solve this problem of the pants falling down when doing a lot of running. Does it matter what kind of pants you wear asked Dahlia?



Page 7: I can understand your problem said Elizabeth, because it sometimes happens to me. I guess this come be a type of problem that happens to lots of us said Hannah. Does this happen at certain times of the year or with certain type of pants ask Emma? We need to know all the facts she said like one of the TV characters in a detective show she watches. She felt really grow up doing this. As they asked Matthew more questions, you could see every one of the play group was getting excited about helping to understand the problem. Then Cal broke the spell when he said "what's the big deal, just pull up your pants and continue playing"

Empathy ... Walking in someone shoes.

Page8: the group had to think about that for a while, but they came back with 'it breaks your running pattern when you have to pull your pants up and move your hands in a different way you want to have them when you're running". So the team continued on now knowing that a fix needed not to use your hands while you're running. The group decided to play a catch game and formed some teams and made up some rules to play by.

It seemed that everyone had a good time and all were much more aware of the possible situation now that Matthew told of his "BUG" Some of the boys noticed their pants slipping and even some of the girls as well. A few who were wearing dresses that had a attached top to them did not notice. Could there be any **clues** in that?



**Real
Problem**

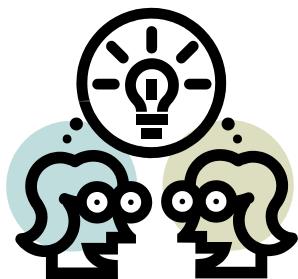
Page 9: Everyone agreed after the game that they now had a problem to solve and they would do it together the next time they meet.

They agreed that the problem or bug they had to solve was “**How to prevent your pant from slipping down while running without using your hands**” The next couple of days before they met again was exciting for many of the team. Ideas would pop into their heads at all times. One of the group, Madeline even went and got a note book to **capture** her ideas because she was forgetting some of the good ones.

At school, they all agreed to meet at Matthews house to try and come up with a list of possible fits. Dahlia said she would see Mr. Liu and ask him what they could do to get lots of ideas to fits the problem.

Page 10: finding lots of potential solutions...

When they meet, Dahlia told the group what Mr. Liu had said to her. He explained about Brain Storming and Brain-Writing as a way to get good ideas. Mr. Liu said that each of these methods could help us get many potential ideas. He said that to do it right, we had to follow some rules. The rules weren't hard to follow but we



Rule 1: Postpone and withhold your judgment of ideas

Rule 2: Encourage wild and exaggerated ideas

Rule 3: Quantity counts at this stage, not quality

Rule 4: Build on the ideas put forward by others

Rule 5: Every person and every idea has equal worth

had to do it. The rules were:

No idea was bad and we should not judge what each of us said when we gather the possible solutions to the problem. We should not be limited in our ideas but think **magical** about possible solutions. Also we should look for quantity and not worry about being right or the best idea. We should try to build on ideas from each other and all of us had equal worth. This sounded like some good advice from Mr. Liu. When we brain-storm, someone writes the ideas we have and puts them up on a wall with sticky note paper.

The brain –writing was very similar to brain-storming but we wrote the ideas on a card and passed the card to the next person on our right. We would read the card and then write our idea on another card. These kept getting passed around until we reached our goal. This all sounds complicated but I think we can do it.



Page 11: The team got together the next afternoon after school all excited about trying this out. Many of the group had some ideas and couldn't wait to tell the others. How are we going to do this asked Matthew? Emma who had been thinking about this said; we need someone to be the person to write each idea on a sticky note when it's said. We should go in turn and we should put the rules up on the wall so all will see them. Hannah said she would like to be the person to put the ideas on the sticky note as she like to spell different words. Cal said he would like to be the person or **facilitator** who made sure we following the rules and our discussion followed the 6 Flags approach. It seem to the group like when they play a game, they decide on rules and choose who is going to do what in the game!

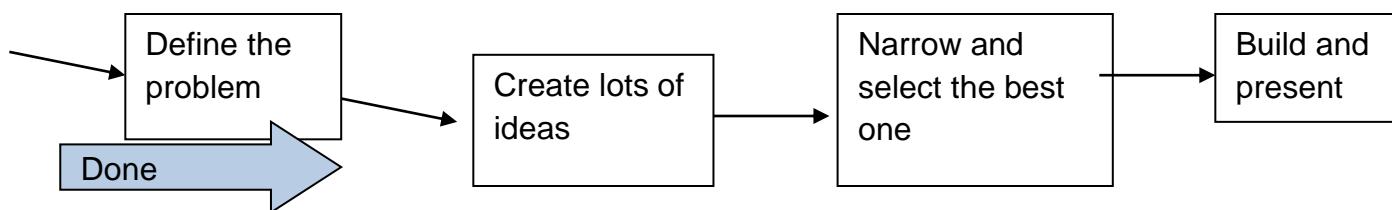
*Make a belt with
Velcro to hold the
pants*

*Glue the pants to
the shirt*

Page 12: reflection what have we done so far ... can we draw a plan?

Just as the group was about to start this fun activity; Matthew's mother came home and could see all this activity . She asked what was going on and did they have a plan? Matthew and the rest of the children want to start doing there project and they did not know what a plan his mother was talking about. Elizabeth told Matthew's mom what they were doing based on Matthew's "bug". It felt good to re-think all the things they had done so far.

Dahlia told about the 6 Flags to keep the dialogue from getting into an argument. Emma mentioned how they learned from Mr. Liu to really understand the problem you are trying to solve, Cal told about learning how to find lots of ideas using Brain-storming or brain-Writing. They all agreed it was like when they plan a game, they need rules and people have different responsibilities. Matthew's mom, said they have the basis of a fine plan of different steps and she showed them what she meant. She also mentioned that this is what they did in the engineering team at work of which she is a member.



Page 13 Brain storming ... How do we do this? With the key jobs taken, they started around the room telling their idea to solve the problem. Emma reminded everyone that they where to think magical and not worry about failure. Don't worry about all the details at this stage of the idea generation. The following were the thoughts:

Name	Idea
Matthew	Matthew thought about how his grandfather used

	suspenders so he thought about making a pair of suspenders for children
Madeline	Building on Matthews idea, Suspenders that are adjustable
Elizabeth	Make a belt with Velcro to hold the pants
Dahlia	Make a belt that holds the pants and the shirt with Velcro
Emma	Use a rubber band on the top of the pants and smaller rubber band on the legs
Cal	Cal has been studying about air pressure at school. He connecting the two. Make a pump belt that you can fill with air by pressing on the belt buckle when they start to slip
Hannah	Make a pair of pants that has room for two belts
Start again	Madeline and Hannah were feeling pressure when doing this in front of everybody. Emma couldn't think because she was busy writing.
Matthew	Have Velcro around the bottom of the shirt and where the belt would be and tie them together
Madeline	Create stick on Velcro strips that can be attached to your shirt and pants.
Elizabeth	pants that have a strip of glue like material that's like the sticky note pad.
Dahlia	Wear a dress
Emma	Wear a garment that looks like a pants and a shirt but it is one piece
Cal	pants that have a strip of material the expands when it starts to slip.
Hannah	Pants that have little propellers that spin when you move and tighten the belt.
FINISH	

Emma who had been writing all these ideas down on sticky note pad paper was getting a little tired. Cal who was making sure the rules were being followed thought he needed to do something different to keep up the great effort that had already happened.

Another technique to keep the ideas flowing: “Cracking Creativity”
pg 154

“Thought Walk” either imagine objects that you would see on a walk through some place or take an actual walk and come back with 4 or 5

~~things or objects that interested you. Select the first object and describe what comes to mind. Write a word or phrase. Draw a picture. Study the list and come up with descriptive characteristics (specific parts, relationships, what it does, its essence) Use these items to force connections between them and your challenge.~~

~~Page 14:~~ Some times when some of us are shy we can use Brain writing

~~Page:14:~~ At this point everybody was a little tired and the group decided that they had enough ideas to work with. Cal who was the facilitator said the next thing they should do was sort the ideas in piles of three. The three piles were

Magical

Stretch

Mundane

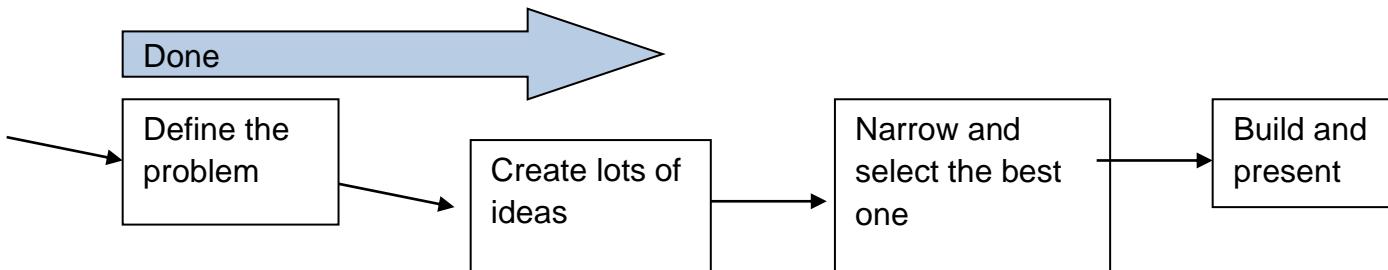
Hannah asked why are we doing this? Could it be that we can make a better idea by doing this she continued. I know said Emma, we will be able to work on ideas that are possible but are different than existing solutions. Cal said they are both right and he started to go through the list of ideas with the group.

~~Page 15~~ Can we sort them around mundane, stretch, magical to get a better solution

Magical	Stretch	Mundane
Belt with air pressure	Bet and shirt with Velcro	Suspenders for children
Pants that tighten when you are running	Velcro strips for the pants and shirt	Adjustable suspenders
Pants with propellers that tighten the belt	Dress that looks like a shirt and pants	Pants with two belts
	Pants with glue like that used on sticky notes	

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The team looked at the list and seem very pleased with themselves. They thought they had some **potential** solutions for Matthew. Now they were going to decide which ideas they should take to the next step. They thought the magical idea of a belt using air pressure was exciting concept and they never saw one in the store. They also liked the idea of using a propeller that would spin when Matthew was running so it could change the belt. Elizabeth said how about putting the two together seeing if this could be a stretch ideas for us to work on. Madeline liked using the strips of Velcro as a solution as well. But how are we going to make a choice said Emma.



Page 16 How are we to judge them ... Requirements

Matthew's Mom had said we needed to think of lots of ideas which we have and then she said the next step was to narrow down to a few possible solutions. The group was happy that they were following a plan that seemed to be working and they were having fun doing this. Cal then asked the group what things are important about what the design should be. He said one item or **requirement** could be; that we can get the materials we need to do the idea. Dahlia said she thinks it should be different from other potential solutions. Kind of exciting like we are Inventors. Hannah piped in; It should meet the needs of Matthew problem. It should be safe and easy to use for Matthew said Hannah. Emma wrote the list of requirements on a piece of paper.

Requirement

Have materials to build
Different than a belt
Safe
Easy to use.

Page 17: Let's pick out the 2-3 best ones

The team talked about the list of ideas they had and agreed to the following ideas that they should evaluate:

- Belt with air pressure that uses a propeller to activate.
- Pants with glue like that used on sticky notes
- Velcro strips for the pants and shirt

The other ideas were either similar or very much like the belt that didn't work so they eliminated them.

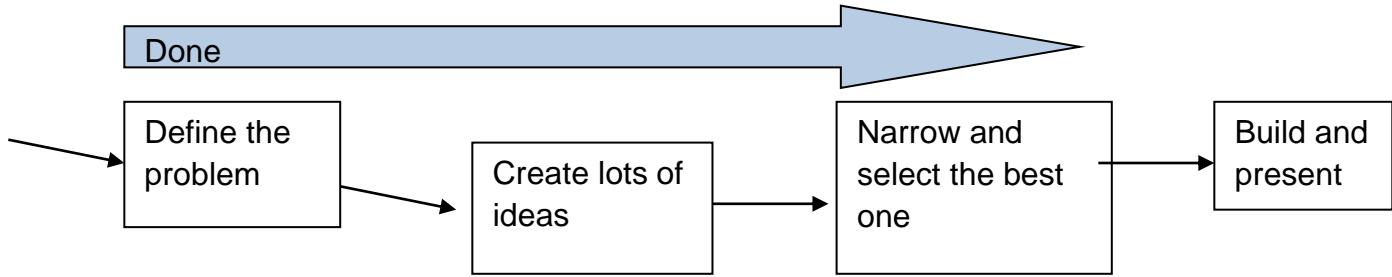
But how are we going to use the requirements to judge our ideas said Dahlia? How about if we ask Mr. Liu, if he knows how to do this continued Dahlia. So the next day at school, the group saw Mr. Liu and asked for his help. Mr Liu, explained how to construct a matrix that lists the various requirements and the ideas we want to evaluate. We can then give each requirement a weight (importance) that we can use to assess each idea against the requirement. He shows us how we can use the numbers 1 thru 9 as the weight. If a requirement is really important we would assign it a 9, versus if it was just nice to have it would be down towards a 1.

The # of 1-9 used in the column for the ideas were how they related against each other. So if an idea was the best in the group against a requirement is got an 9 versus a low # being not so good. Since we had 3 ideas, we needed three columns for them. Everybody was really excited to start building this chart.

Should we show three charts as the # are filled in?

Requirement	Weight	Belt with air	Glue like sticky notes	Velcro stripes

		pressure		
Have materials to build	8	7 (56)	1 (8)	9 (72)
Different than a belt	3	9 (27)	8 (24)	7 (21)
Safe	8	7 (56)	8 (64)	8 (64)
Easy to use.	9	9 (81)	5 (45)	7 (63)
Total		220	141	220



Page 18: Can we draw a picture/ sketch of our solution/ creation

The group looked at the numbers and thought that it was a good selection process and it came down with 2 ideas that they should look to work on. I was surprised that our weighting gave us two equal choices said Elizabeth. The sticky glue idea would work but it was too difficult for us to do because we can't develop the glue. If the company that made the note pads was doing this process, Elizabeth said this would come out #1. Cal said to the group that we should sketch out our idea on a piece of paper that has a picture of the idea and notes to describe how it goes together and works. We decided to split into two groups to work on the sketch. One group would do one sketch the other group would do the other sketch.

Page 19 ... Comparing the sketches and discussion

Belt with balloon and propeller

Velcro Strips

Discussion: the two teams looked at the sketches and really liked them. The group that did the belt with the balloon talked about how it had been hard to draw the picture and show how they thought it should be. Showing where the balloon came out was difficult said Emma. They felt real grown-up because they had created some great ideas to help Matthew hold his pants up. Madeline said she thought that Mr. Liu class would really like to hear what they had done on their own. Elizabeth thought that was a great idea and that they should talk to M. Liu when they go to class tomorrow.

Page: Vocabulary

Page: Higher order thinking questions

Page Reflection

Page Games

List of Bugs ... Situation; playing outside with a friend

List:



1. When we come up with a good game and there are not enough friends present to play it.
2. They lock the playground when we want to play
3. Can't get the batteries out of my game to change them
4. I can't open my water bottle when I want too.
5. I can't see the ball when somebody throws it to me.
6. My shoe lace (Velcro) comes untied when I am running
7. My pants slip down when playing.
8. How do I get this water bottle to shoot up in the air?
9. I can't carry a heavy item very far
10. I can't build a good kite
11. I can't eat a peanut butter sandwich