FIRST® LEGO® League

TUTORIALS

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CAIETUL DE INGINERIE

SESHAN BROTHERS

CE ESTE UN CAIET DE INGINERIE?

- Documentarea este un aspect foarte important în *FIRST* LEGO League și ceva ce poți împărtăși cu jurații în timpul sesiunilor de jurizare.
- Caietul de inginerie este un mod de a înregistra călătoria echipei în tot sezonul FIRST LEGO League.
  - Înregistrează procesul de design și construcție a robotului.
  - Înregistrează cercetările, excursiile și interviurile precum și testarea soluției voastre.
  - Înregistrează evenimentele de outreach, ce ați făcut în timpul întâlnirilor echipei și chiar ideile viitoare.

Pe scurt, puteți înregistra TOTUL!

FLL Tutorials furnizează unele pagini din actualul Engineering Journals în FIRST LEGO League și furnizează de asemenea câteva șabloane goalepentru ca echipa voastră să le utilizeze (vezi Worksheets secțiunea Resurse)

CE PUTEȚI INCLUDE?

- Fotografii și desene
- Desene în LDD CAD a robotului
- Planuri pentru sezon și sarcini de îndeplinit
- Discuții & decizii din timpul întâlnirilor echipei
- Ideile de design ale robotului și atașamentele și testele
- Pseudocodul și Print-urile codului
- Problemele pe care le-ați întâmpinat
- Îmbunătățirile pe care le-ați realizat
- Ideile pe care le-ați avut

CÂTEVA ÎNTREBĂRI CARE SUNT UTILE

- Care este scopul întâlnirii de azi?
- Ce decizii au fost luate azi?
- De ce ați luat această decizie?
- Ce ați încercat azi?
- Ce a mers, ce nu a mers?
- Când ceva nu a mers, cum ați rezolvat problema?
- Ce modificări plănuiți să faceți data viitoare?
- Care sunt următorii pași?

JURNAL DE INGINERIE EXEMPLUL 1

- Înregistrează cum echipa a gândit strategia Jocului Robotului
- Înregistrați ce misiuni au fost îndeplinite și pseudocode-ul
- Înregistrați cine ce va lucra

Student Name:
Date:

Goal: Today we worked on developing a robot strategy. Each student on the team came up with their own strategy plan. They presented it to the team. We discussed each one and then we merged the ideas together, taking the best ideas.

This is our final plan: We plan to have 4 runs from base.
In run 1, we will do M01, M06, M09, M15. We feel this will work well since there are lines to follow and the missions are close together.
Run 1 Pseudocode: 1) The robot will leave base and head towards…..

In run 2, we will do M03, M25, M07
Run 2 Pseudocode: 1) The robot will leave base and head towards…

Next Steps:
John, Jessica and Ellie will work on run 1 attachments programming
Fred, Eli, and Ananth will work on run 2 attachments and programming
Eric and Samantha will work on creating the base robot.

JURNAL DE INGINERIE EXEMPLUL 2

- Înregistrează testele pe diferite șasie de robot

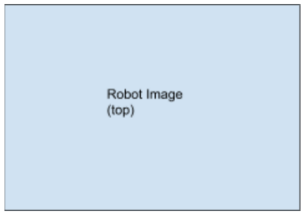
Student Name:
Date:

Goal: Comparing different robot designs.

Robot #1

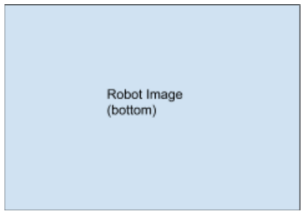
What works well

- It has a low center of gravity.
- It drives and turns accurately.
- It has 4 walls protecting it from external forces.
- Dual color sensors (Shielded) for line squaring
- Gyro sensor position in the middle and out of the way.
- Lots of areas to to add attachments



What needs improvement

- Weight balance between front and back is causing robot to jerk
- Robot is tilting back too much
- High walls seem to be making it heavy
- We only use 3 of the 4 available motors



Next Steps

- Position the Brick more backwards to balance out weight.
- Leave charging port more easily accessible.
- Add one more motor.
- Experiment with different wheels.

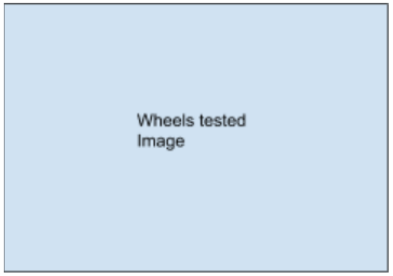
Sample Comparison Table:

Robot	Size	Wheels	Motors	Sensors	Strength	Speed
Robot 1	17X10X15cm	Edu wheels 2 ball bearing	4 Large	1 color	Low center of gravity	Medium speed
Robot 2		Large Motor Cycle Skids	2 Large 2 Med	2 color Gyro	Tall	Fast

JURNAL DE INGINERIE EXEMPLUL 3

- Înregistrează alte teste ca cele de comparație a diferitelor roți

Student Name:
Date:



Goals: Compare different robot wheels

Today we tested different tires for our robot. The goal was to make a decision on which tire to use.

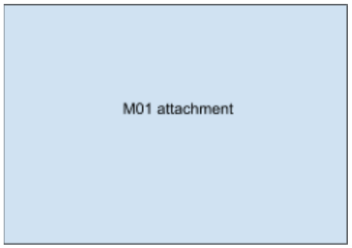
Category	Robot 1 with EV3 Edu Wheels	Robot 1 with Large Motorcycle wheels	Comments
Move Straight 25 inches	Worked well	Curved, jerks	
Four 90 degree Right and Left t			

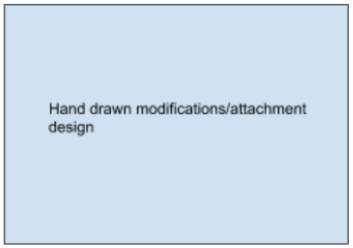
JURNAL DE INGINERIE EXEMPLUL 4

- Documentează diferite idei de atașamente
- Documenează interviurile/excursiile

Student:
Date:

Goal: Work on Mission 01. The pictures show different designs for M01 that we created.





- Initial idea involved a flat box for M01. As we tested it out, we realized that we needed wall guide to make sure that the attachment will align on the mission model.
- We also realized, that a small ramp would help guide the delivery of the model to inside the circle.
- To retrieve the box back, we originally designed frames and beams and used an axle to grab it and bring it back to base.
- We improved the capture method by replacing the frames and beams with light tubes. This would not only make the box lighter but also would give more accuracy for capturing.

Goal: This week we also went on a field trip to the Space Museum and spoke with Astronaut X who volunteers there every weekend. We asked him questions about his experiences. He pointed us to a new resource on the NASA website which we plan to review before our next meeting.

JURNAL DE INGINERIE EXEMPLUL 5

- Documentează țintele pe care le-ați setat
- Documentează problemele întâlnite
- Documentează ce ați lucrat în timpul întâlnirilor

Student:
Date:

This week we accomplished the following goals:

- Made a plan for what we want to get done by our qualifier. We all sat down and had a discussion on how we should organize our documents.
- We made some more progress on our third run. We made this run more consistent by using our color sensor to find the line. We also added M08 to this run so that we could increase out points.
- We had to test our color sensors this week. Last week we decided that if we wanted to go over the ramp we would have to move our light sensors up as they were hitting the ramp. When we were testing the mission where we go over the ramp, the light sensors would get in the way and our wheels would lift a little bit off the ground. Now, we lifted the light sensors up and tested that mission run and it worked, but we also had to recalibrate our light sensors so they can still sense lines.
- We also started working on our presentations this week. We started working on them before the meeting was over. It was good to do this at the meeting so that we could discuss with the team and make sure that everyone else was on track of all the presentations.

CREDITS

- Această lecție a fost scrisă de Arvind și Sanjay Seshan
- Mai multe lecții despre FIRST LEGO League sunt disponibile pe www.flltutorials.com
- Această lecție a fost tradusă în limba romană de echipa FTC Rosophia #21455