

Οι μαθητές εργάζονται σε περιβάλλον
Arduino, σε ένα οργανωμένο παιδαγωγικό
πλαίσιο και δημιουργούν τους δικούς τους
«αισθητήρες»

Η ομάδα μας

Παιδαγωγικό Πλαίσιο

Constructivism: Constructivist teaching approaches emphasize exploratory learning and the solving of realistic problems

- A particular characteristic of everyday realistic problems is that they are (more or less) open, in the sense that there is not a single "right" solution, and therefore, there is not a single "correct" method of solving. Often, the **data** is not totally given, so they need to be redefined by the student

Παιδαγωγικό Πλαίσιο

Social Constructivism: the educational process is a highly collaborative activity.

- Students work together and along with the teacher, who facilitates the building of knowledge by providing appropriate scaffoldings.
- Knowledge is not an individual construction but a social event, a way of understanding the world shared in the team. The teacher works as a mediator, facilitator in the (social) knowledge building

Παιδαγωγικό Πλαίσιο

Constructionism: Papert & Harel (1991), adopting the learning approach as the building of cognitive structures, introduce the idea that this knowledge building is more successful “in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe”.

Παιδαγωγικό Πλαίσιο

Constructionism: LOGO language and LOGO like programming environments.

- These technological proposals have enabled students to produce artifacts,
- teachers working as inspiratory as well as experienced supporters (facilitators) in the realization of students' ideas.
- The artifacts can be easily changed and transformed, so students can experiment with both their ideas and the ideas of their peers, thus building new knowledge.

Physical computing / collaborative knowledge building

Physical computing:

- makes it possible for the computer to interact with the outside world by receiving sensor stimulations (sound, light, temperature, etc.), changing the conditions and reprogramming the interaction.
- Students, by designing and implementing (or modifying) collaborative constructions, become both "engineers" and "technicians" while testing their knowledge and skills in science and mathematics. At the same time, they are given the opportunity to create their own interactive objects, based on their own imagination.

Physical computing / collaborative knowledge building – STEM

An integrated approach as the above comprises a dimension of STEM education.

- The significance and priority given internationally to this view has been manifested in the literature and has become a central pillar of reform policy in many education systems



The word "STEM" is written in large, bold, sans-serif capital letters. The letters are colored in a gradient from dark teal to dark green. Each letter contains a white icon: a DNA double helix in the 'S', a circuit board pattern in the 'T', a gear in the 'E', and a ruler in the 'M'.

Science • Technology • Engineering • Math

Εμείς: Η εμπειρία μας στην εκπαιδευτική ρομποτική και τον φυσικό προγραμματισμό

- Λίγα χρόνια
- Σε μεγάλη ηλικιακή γκάμα «μαθητών»
- Με επιλεγμένες τεχνολογικές λύσεις/πλατφόρμες (ποιες/γιατί?)
- Με συγκεκριμένη γενική στοχοθεσία (ποια/γιατί?)
- Σε συνέχεια και παράλληλα με άλλες εκπαιδευτικές και ερευνητικές δραστηριότητες

8 Big Ideas of Maker Centered Education

1 Learn by doing!

We all learn better when learning is part of doing something we find really interesting. We learn best of all when we use what we learn to make something we really want.

2 Technology as building material!

If you can use technology to make things you can make a lot more interesting things. And you can learn a lot more by making them. This is especially true of digital technology.

3 Hard fun!

We learn best and we work best if we enjoy what we are doing. But fun and enjoying doesn't mean "easy". The best fun is hard fun. Our sports heroes work very hard at getting better at their sports. The most successful carpenter enjoys doing carpentry.

4 Learning to learn!

Many students get the idea that "the only way to learn is by being taught". This is what makes them fail in school and in life. Nobody can teach you everything you need to know. You have to take charge of your own learning.



5 Taking time!

Many students at school get used to being told every five minutes or every hour to do this, or do that, and now do the next thing. If someone isn't telling them what to do they get bored. Life is not like that. To do anything important you have to learn to manage time for yourself.



6 You can't get it right without getting it wrong!

Nothing important works the first time. The only way to get it right is to look carefully at what happened when it went wrong. To succeed you need the freedom to goof on the way.



7 Do unto ourselves what we do unto our students!

We are learning all the time. We have a lot of experience of other similar projects but each one is different. We do not have a pre-conceived idea of how exactly this will work out. We enjoy what we are doing but we expect it to be hard. We expect to take the time we need to get this right. Every difficulty we run into is an opportunity to learn. The best lesson we can give our students is to let them see us struggle to learn.

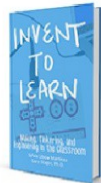


8 Digital world!

We are entering a digital world where knowing about digital technology is as important as reading and writing! SO learning about computers is essential for our students' futures BUT the most important purpose is using them NOW to learn about everything else.

Για την κατασκευή στην εκπαίδευση

- Μαθαίνω κάνοντας
- Η τεχνολογία ως δομικό υλικό
- Διασκέδαση
- Μαθαίνοντας να μαθαίνεις
- Πάρε το χρόνο σου
- Δεν μπορεί να το κάνεις σωστά χωρίς να το κάνεις λάθος
- Μπαίνουμε στη θέση των μαθητών μας
- Ψηφιακό περιβάλλον



by Dr. Seymour Papert
as found in Invent to Learn

Η εμπειρία μας σε ... ηλικίες εκπαιδευομένων

- ✓ Μαθητές Δημοτικού
- ✓ Μαθητές Γυμνασίου εντός μαθήματος Πληροφορικής
- ✓ Μαθητές Γυμνασίου σε Όμιλο Εκπαιδευτικής Ρομποτικής
- ✓ Προπτυχιακούς φοιτητές Παιδαγωγικών Τμημάτων
(Αθήνα/Ιωάννινα)
- ✓ Μεταπτυχιακούς φοιτητές (εν ενεργεία και υποψήφιοι
εκπαιδευτικοί)
- ✓ Επίβλεψη διπλωματικών εργασιών μεταπτυχιακών φοιτητών
(ΕΑΠ/ΕΤΑΕ)

Η εμπειρία μας σε ... τεχνολογικές λύσεις

Μαθητές Δημοτικού



Μαθητές Γυμνασίου εντός μαθήματος



Μαθητές Γυμνασίου σε Όμιλο



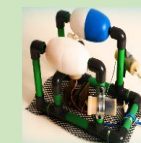
Προπτυχιακούς φοιτητές



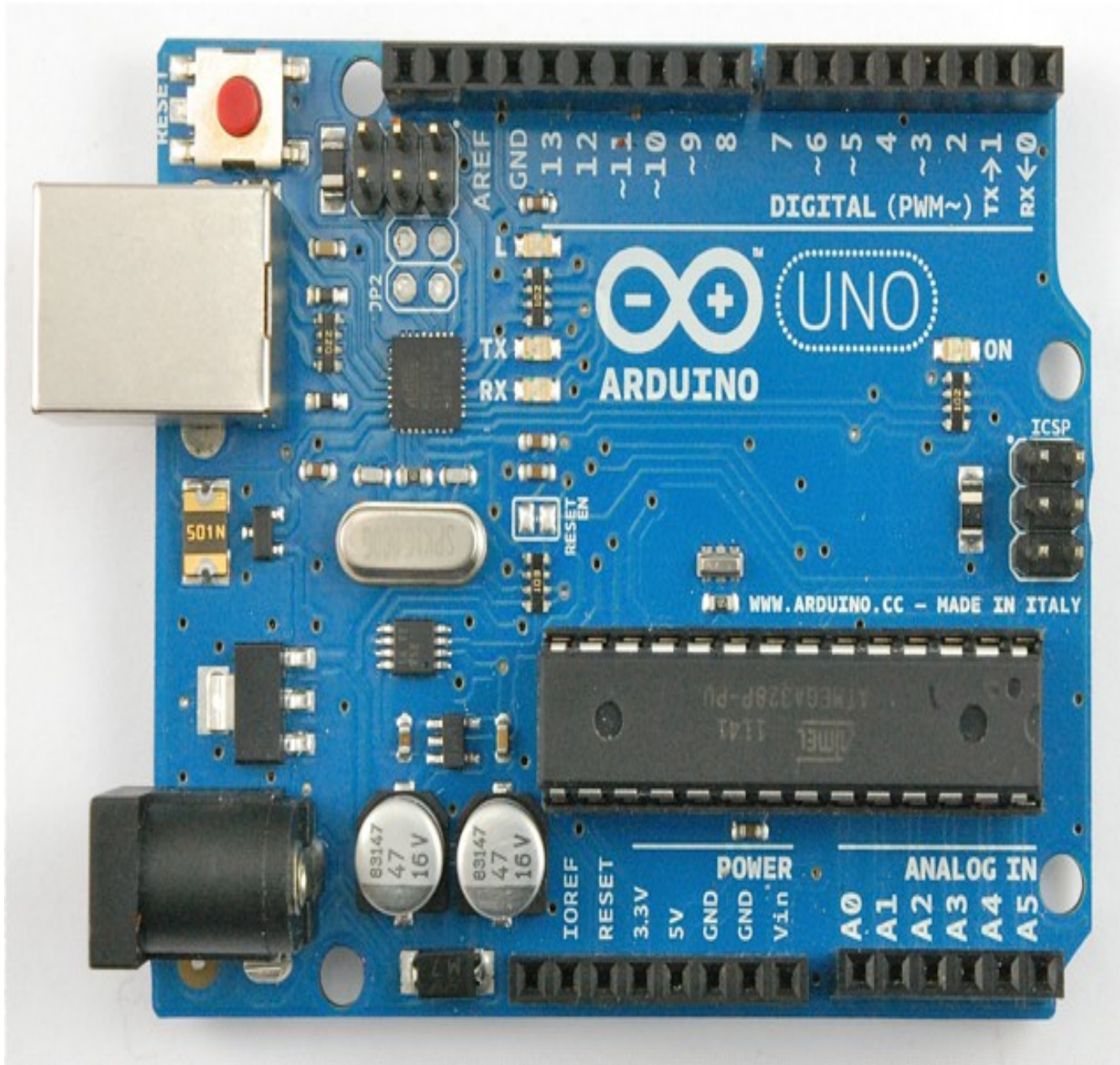
Μεταπτυχιακούς φοιτητές



Επίβλεψη διπλωματικών εργασιών



Εδώ εστιάζουμε στο Arduino



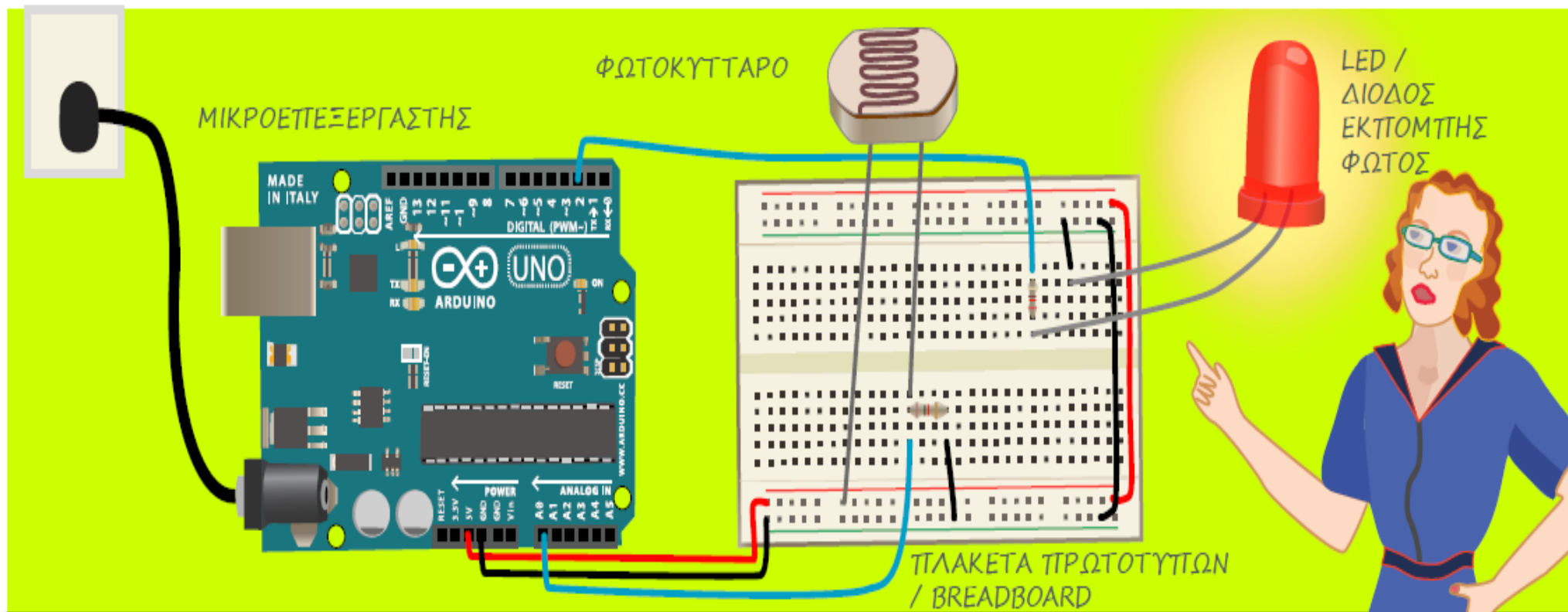
Τι είναι το Arduino



The Arduino Revolution

Arduino is an open-source physical computing platform designed to make experimenting with electronics more fun and intuitive. Arduino has its own unique, simplified programming language, a vast support network, and thousands of potential uses, making it the perfect platform for both beginner and advanced DIY enthusiasts.





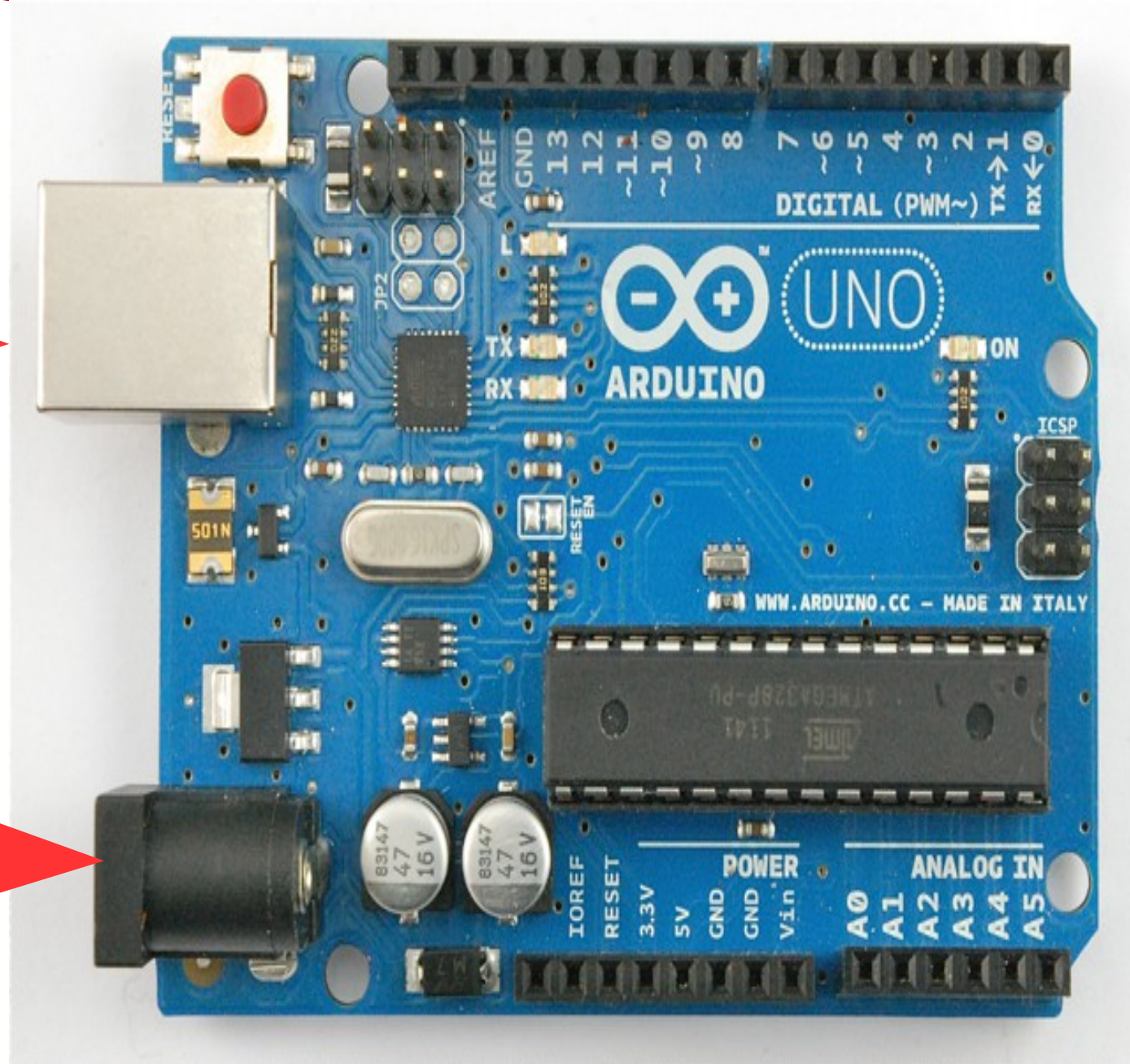
ΕΝΑ ARDUINO ΠΕΡΙΕΧΕΙ ΕΝΑ ΜΙΚΡΟΤΣΙΠ, ΔΗΛΑΔΗ ΕΝΑΝ ΠΟΛΥ ΜΙΚΡΟ ΥΠΟΛΟΓΙΣΤΗ ΠΟΥ ΜΠΟΡΟΥΜΕ ΝΑ ΠΡΟΓΡΑΜΜΑΤΙΣΟΥΜΕ. ΣΕ ΑΥΤΟ ΣΥΝΔΕΟΝΤΑΙ ΣΕΝΣΟΡΕΣ ΠΟΥ ΔΕΧΟΝΤΑΙ ΕΞΩΤΕΡΙΚΑ ΕΡΕΘΙΣΜΑΤΑ (ΓΙΑ ΠΑΡΑΔΕΙΓΜΑ ΤΟ ΠΟΣΟ ΦΩΣ ΥΠΑΡΧΕΙ ΣΕ ΕΝΑ ΔΩΜΑΤΙΟ) ΚΑΙ ΜΠΟΡΕΙ ΝΑ ΚΑΘΟΡΙΣΕΙ ΤΟΝ ΤΡΟΠΟ ΜΕ ΤΟΝ ΟΠΟΙΟ ΑΛΛΑ ΑΝΤΙΚΕΙΜΕΝΑ ΑΝΤΙΔΡΟΥΝ ΣΕ ΑΥΤΑ (ΟΤΑΝ ΣΤΟ ΔΩΜΑΤΙΟ ΣΚΟΤΕΙΝΙΑΖΕΙ ΑΝΑΒΕΙ ΕΝΑ ΦΩΣ).

Τα βασικά στο Arduino

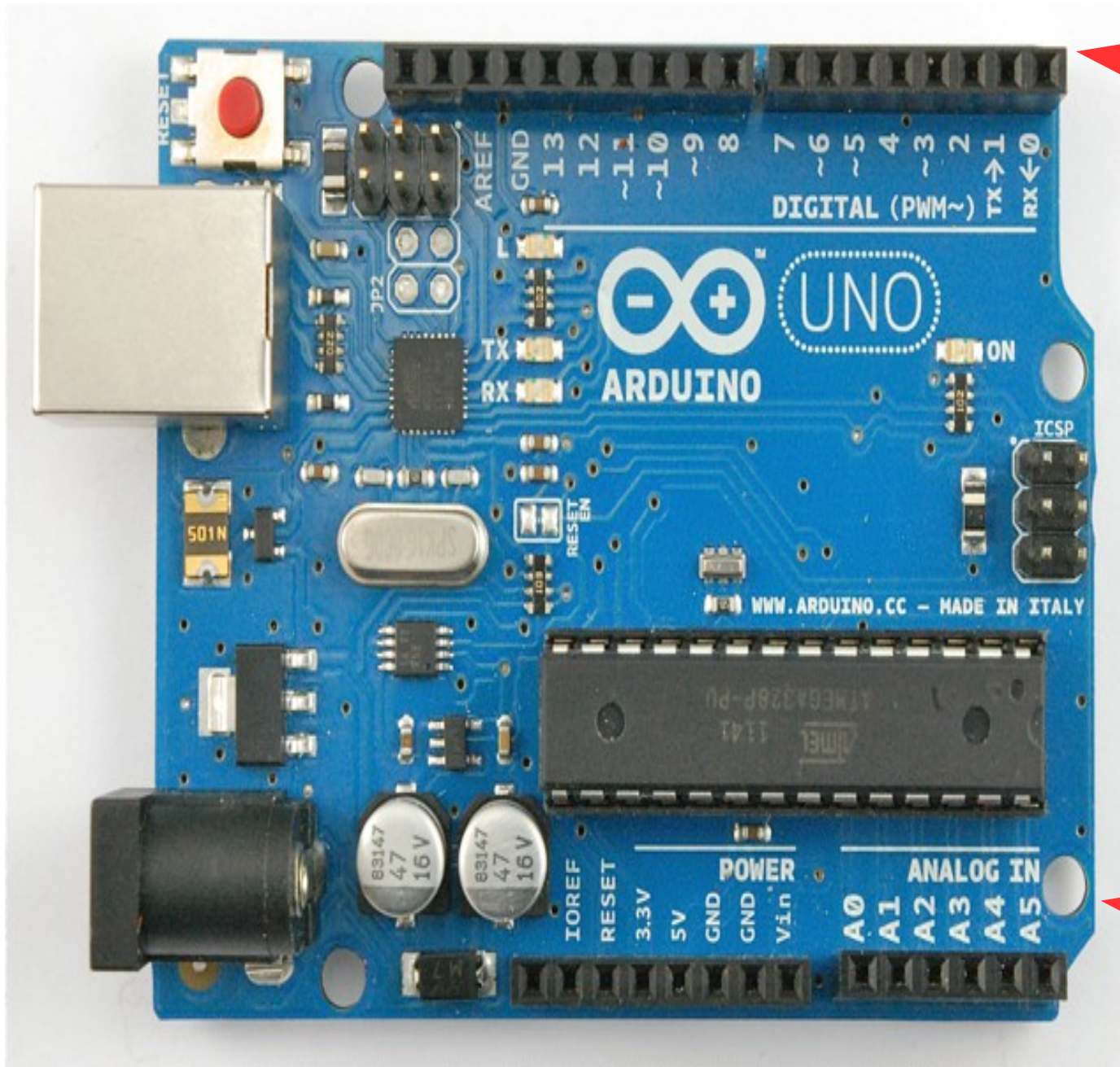
Επικοινωνία με
τον ΗΥ
Τροφοδοσία 5V



Τροφοδοσία 7V
έως 12V



Τα βασικά στο Arduino

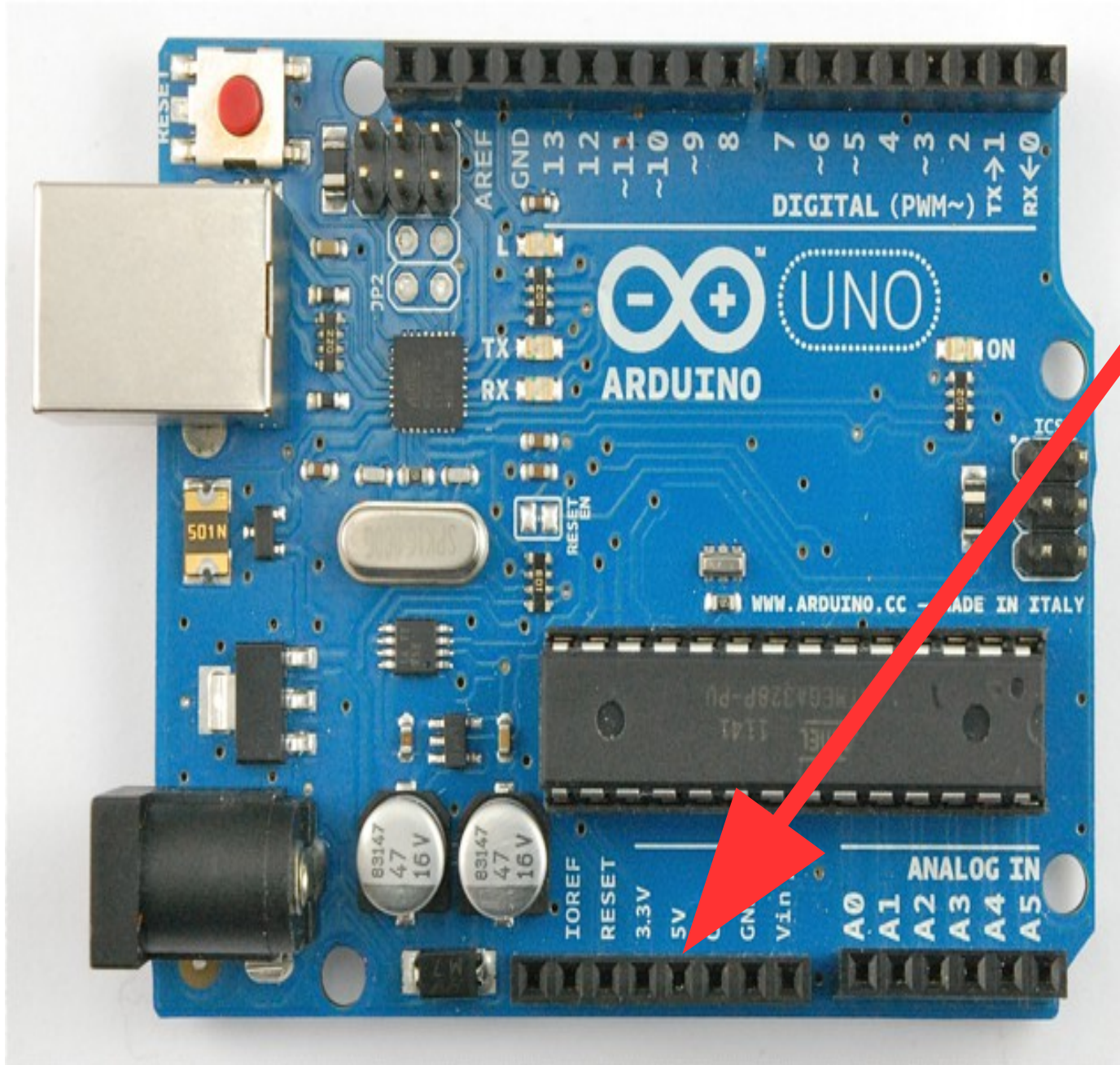


Ψηφιακή
Εισοδος / εξοδος
0V ή 5V (High /
Low

“Αναλογική”
εξοδος
“περισπωμένες”
0V ως 5V (0-255)

“Αναλογική”
είσοδος (0-1023)

Τα βασικά στο Arduino



5V, GND Παροχή τάσης για τα κυκλώματα και τις κατασκευές μας. ΠΡΟΣΟΧΗ!!!! δεν τροφοδοτούμε το μαγνητοπήγαδο από εδώ!!! Θα χρειαστεί να βάλουμε εξωτερική πηγή.

Τα βασικά στο Arduino



ΜΗΝ ΣΤΕΝΑΧΩΡΙΕΣΤΕ ΑΝ
ΔΕΝ ΤΑ ΚΑΤΑΛΑΒΑΤΕ
Θα μάθουμε φτιαχνοντας
Είμαστε **constructionists**!!!!

ΣΥΝΕΧΙΖΟΥΜΕ ΒΗΜΑ ΒΗΜΑ με την
επόμενη παρουσίαση!!!